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A PROPOSED INDUSTRIAL EDUCATION CURRICULUM FOR TRAINABLE MENTALLY HANDICAPPED STUDENTS

BY

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Clarius R. Young

Supervisor

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Date 12 February 1985

DEDICATION

This thesis is dedicated to all the trainable mentally handicapped students, their teachers, the school board members and all people interested in the pursuit of top quality education for special needs students.

ABSTRACT

The objective of this research was to develop a curriculum specifically for trainable mentally handicapped in the area of industrial and vocational education. No Canadian provincial Department of Education currently has a curriculum for trainable mentally handicapped students in industrial and vocational education. No other provincial Department of Education in Canada has a curriculum guide to meet the educational needs of these special students.

Industrial education teachers are not well prepared for meeting the educational needs of the trainable mentally handicapped students and this thesis will fill a gap in the educational process of these students.

Specific characteristics with respect to learning difficulties, behaviour problems and the range of abilities of these students was obtained from a variety of journals, books and microfiche of studies done in the United States.

The curriculum was written in such a way that a teacher could adapt the material to students with more or less ability, or if the time available for teaching this class and/or the amount of supervisory help changed. The curriculum is therefore very flexible to a variety of industrial education teaching situations.

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CHAPTER 1

INTRODUCTION

Special education students commonly, and until recently called slow learners, have been in our schools since the time of Calvin Woodward, but industrial education teachers have rarely welcomed them. Traditionally the industrial-arts-as-a-dumping ground approach has been used towards these students, and this is an idea that must be combatted (Brennan, 1968, p. 309).

The Provincial Government of Alberta is providing more dollars and capital equipment for industrial education (Building Qualities Restoration Program 1978 - 1981), as well as special education in general. The education of the slow learner and handicapped student (nearly eight percent of the provincial school population) is becoming increasingly important.

It is a provincial responsibility to provide a basic education for each and every student in the province. Ralstrom states that:

> The high dropout rate, loss of potential manpower, cost of unemployment, crime, and the threat to sound family relationships can be traced, at least in part, to the lack of commitment by the [provincial] government to meet the educational needs of these students (Ralstrom, 1971, p. 88).

The Problem

Industrial education teachers are still not well prepared in the instruction of slow learners and are, therefore, reluctant to try new approaches to or develop curriculum modifications to provide a meaningful part of the slow learner's

education. There is presently no provincial curriculum developed for the industrial education of the trainable mentally handicapped students.

First, the needs of the trainable mentally handicapped students must be identified and accepted by industrial education teachers if there is to be any success in educating these students.

Second, these students are plagued by frustration, defiance of authority, failure, high peer pressure, ridicule, labels and social isolation. Education has not provided positive experience for the slow student. Too often a poor grade says more about the quality of instruction than the ability of the child.

Third, the increased funding is an acknowledgement by the Alberta Provincial Government that special education needs are important. However, at the instructional level in industrial education basic attitude changes must occur.

Fourth, industrial education cannot afford to neglect any of the special education component. In practically no other program, with the exception of home economics, can the variables be manipulated so well to provide just the right experiences to meet the needs of these special students.

Fifth, active programs in industrial education can afford opportunities for exposure to color, odor, texture, sound exploration and guidance with respect to materials, tools, processes, and in general, total sensory involvement.

Sixth, considering the characteristics of the trainable

mentally handicapped student, these students need more time, effort and resources made available for their education.

Industrial education teachers must realize that they have a vital part to play in meeting the needs of the special education student and that as the provincial government places more resources towards special education, the curriculum material will be delivered to the teacher. However, this is a slow process so industrial education must do this job itself and do it while the need is evident.

Objectives

The purpose of this study is to identify several characteristics of trainable mentally handicapped students and to develop several useful documents with regard to trainable mentally handicapped students in industrial education.

Need For The Study

Schools have a responsibility to students, to parents and to all members of society to educate the youth of today, and not just the majority but also the eight percent of the school population which falls into the category of special education. At Sir George Simpson School the number of special education students is 74 out of a total school population of 507. The number of trainable mentally handicapped students at this school is 12. Any possible method that can be established to assist with or accomplish this goal will contribute to a better educated citizen. Traditionally meeting the needs of special

education students in industrial education has been

> to require fewer and less complex projects, have students use primarily hand tools, expect lower standards of craftsmanship and skill development, require less emphasis on creative problem-solving activities, and require less dependency on reading and written work. As a result a rather large number of special education students enrolled in industrial education courses are not achieving optimal educational benefits (Buffer, 1971, p. 82).

Since schools and school systems have a responsibility to provide a basic and meaningful education for all students and there is no curriculum in effect now, there is an immediate need to develop a practical and valid curriculum project for meeting the industrial education needs of the trainable mentally handicapped students.

Major Definitions

The meaning of some words change over time and when dealing with specific subject matter, these words do not always have the same meanings associated with them as they would have if used in everyday language usage.

Special Education. "Every student in every class has a special need - to be recognized as an individual and started down the path of fulfillment leading to a purposeful life" (American Industrial Arts Association, 1971, p. 72). The term "special education" refers to education for those students who can not function in a regular classroom doing regular curriculum work.

Trainable Mentally Handicapped. L'Abate and Curtis state the classification of the mentally retarded is complicated by the usage of other terms for this same population. For example, the World Health Organization, the American Psychological Association, and the American Association for Mental Deficiency call the trainable mentally retarded the moderately retarded, while the British call this group the 'imbecile' class (Kirk, 1972, p. 51). Weiner states that, generally, trainable mentally handicapped citizens are "able to learn self-help skills and to perform useful tasks in a protected situation" (Sapir and Wilson, 1978, p. 182). Weiner puts forth her own concept of trainable mentally retarded. She states "dimensions of educability" instead of the dichotomy of "educable or trainable" (Sapir and Wilson, 1978, p. 182). Weiner suggests observations on an appropriate assortment of experiences along the dimensions of level, rate, range, and autonomy. Canadian dealings with the subject of trainable mentally retarded students refer to them as trainable mentally handicapped (TMH). For the purpose of this project mentally retarded students will be refered to as trainable mentally handicapped.

The usual practice for groups placing an individual in a TMH class is to use IQ scores as a criterion, a typical range being between 30 and 50 with an allowable deviation of five points in either direction as measured by a reliable individual intelligence test. Also used as a criterion is the student who has demonstrated an inability to function without additional

assistance at an acceptable level academically and/or socially within a regular or educable mentally handicapped classroom. The student must also be able to function with some independence in small groups without custodial care.

Hyperactivity is a "long term childhood pattern characterized by excessive restlessness and inattentiveness. It is a developmental disorder which begins in early to midchildhood (ages 2 - 6) and begins to fade during adolescence" (Safer, 1976, p. 5).

Minimal Brain Dysfunction is "based on a learning or perceptual impairment, usually associated with hyperactivity and inattentiveness" (Safer, 1976, p. 6). Two points of clarification are needed here.

> "First, hyperactivity and minimal brain dysfuction (MBD) are not identical though often considered so. Second, hyperactive children do not always have a learning or perceptual disability, although most do" (Safer, 1976, p. 6).

Assumptions

When organizing the thesis project there are several conditions which must be taken for granted. These assumptions are basic underlying principles of research.

These include:

1. That all questions asked of individuals will be answered honestly and to the best of their ability.

2. When surveying literature on trainable mentally handicapped programs in industrial education, it was assumed that these programs were tested and had been found successful to a stated level.
3. When contacting institutions or schools in major cities across Canada and the United States, it was assumed they will react positively to such a project with the students' best interest in mind.
4. The learning characteristics and special personal characteristics of the trainable mentally handicapped students was expected to be the most recent as obtained by the district councellors using accepted testing procedures.
5. It is expected that the curriculum project for the trainable mentally handicapped in industrial education will be done with the students' best interests in mind.

Limitations

The success of the curriculum project depends upon the curriculum material sent by responding institutions or school boards of major cities across Canada and the United States. Also, the accuracy of the evaluation

system in determining the appropriateness of materials to the objectives of the trainable mentaly handicapped program in the St. Albert Protestant Separate School District No. 6 could be of concern. The curriculum will be sent to the principal of Lorne Akins, William D. Cuts, and, Elmer S. Gish Junior High schools and to key resource personnel at the school board office for constructive criticism. Finally, there are approximately 17 other special education classes operating within the school district at nine other schools, both senior high school and elementary schools which have no direct impact on the junior high school special education component with which this thesis is concerned.

Organization Of The Remainder Of The Thesis

Chapter II will present a review of related research and literature and present several concepts to be aware of while developing a curriculum. Also presented is several teaching strategies to be used in teaching TMH students.

Chapter III will present the methodology used, an explanation of various teaching strategies, and an explanation of task analysis.

Chapter IV will present the curriculum for the trainable mentally handicapped students in industrial education.

Chapter V will present the conclusions and provide a summary of task analysis, a special technique that can be used with trainable mentally handicapped students so they can obtain meaningful instruction in industrial education classes to which they are assigned. The impact of the curriculum upon the education of TMH students and the areas for further study and research are also discussed in this chapter.

CHAPTER 2

REVIEW OF RELATED LITERATURE

The purpose of this section is to present an overview of the literature related to this study. The literature consists of six major sections. The first section identifies the procedures followed during the literature review. The second section discusses the personal characteristics of the trainable mentally handicapped student. The third section explores curriculum design. The fourth section presents different approaches to teaching the trainable, mentally handicapped student. The fifth section discusses general goals of a trainable mentally handicapped program. The final section discusses resource material procurement and resource material evaluation procedures.

Procedures for the Literature Review

Two basic information retrieval strategies were utilized to review the literature. The first stage was a manual search of the card catalog holdings of the University of Alberta Education, Rutherford, and Cameron libraries; the Edmonton Public library; the Instructional Materials Center of the St. Albert Protestant Separate School District No. 6; the St. Albert Public library; the libraries of the Edmonton Public and Separate School Board; the Professional Library of Alberta Education; and the Professional Library of the Alberta Teachers' Association.

Also searched manually were the Dissertation Abstracts; Psychological Abstracts; Resources in Education Index; and the Education Resources Information Center (ERIC). The latter was searched from 1975 to present. The manual search located 29 books and 13 journal articles that are related to the thesis topic. One of the books contained an appendix which identified National Associations in Related Fields. There were 69 associations identified to which the author sent a letter requesting information that would pertain to the thesis topic. Of those 69 letters sent, 31 were answered with some type of letter, brochure or documents. Thirteen letters were returned to the sender with the remaining 25 letters going unanswered. Some material was no longer in print while other material was not available, because agencies have moved and the request for information was not deliverable to the most recently available address.

The American College for Industrial Arts Teacher Education abstracts were reviewed, but no useful documents were obtained from that source.

A catalog of materials was obtained from the Center for Vocational Education at Ohio State University. No useful material was obtained from this source that dealt with the specific topic of the thesis.

The University of Alberta in Edmonton, Department of Educational Psychology was contacted. From this, a researcher at West Virginia University was identified, who sent some material that could be adapted for use with respect to training

these trainable mentally handicapped students.

In the second part of the search computerized information retrieval services were utilized. The ERIC system search resulted in a total of 156 entries in which one, two or all three topics were discussed. The three major descriptors used were Moderately Mentally Handicapped/Trainable Mentally Handicapped; Curriculum/Curriculum Design; and Industrial Arts/Industrial Education. These three descriptors were cross referenced with each other in all possible ways. Some other descriptors appeared with the abstracts generated by the ERIC search. These included: Exceptional Child Education, Learning Disabilities, Mental Retardation, Multiple Disabilities, Physical Disabilities, Vocational Education, Prevocational Education, Exceptional Child Research, Mild Mental Retardation, Vocational Rehabilitation, Work Study Programs, Teacher Education, Inservice Teacher Education, Task Analysis, Job Skills, and On The Job Training.

The abstracts of those 156 entries were then read and of those, eight journal articles and nine microfiche articles were relevant to the topic of curriculum design for the trainable mentally handicapped in industrial education.

The results of these searches indicate that there is no material on trainable, mentally handicapped in industrial education, and there is very little material available on educable mentally handicapped in industrial education.

Personal Characteristics of TMH Students

It is generally accepted that "the trainable retarded tend to exhibit a definite clinical pattern and physical appearance" (L'Abate and Curtis, 1975, p. 52). In addition trainable mentally handicapped students are characterized by a general pattern of incompetence in social situations, rigid or awkward manual and motor movements, slowness in arousal responding, and extreme dependence and helplessness in self-care activities.

Trainable mentally handicapped students lack "system control" (Fisher, 1978, p. 115). The system most affected is attention. These students cannot ignore any of the noise or movement surrounding them and cannot separate important stimuli from those that are unimportant. The diffusion of attention negates the impact of learning and the learning of complex skills requires sustained attention. Memory suffers because concentration is missing and "only repeated exposure finally accomplishes what, for others, happens after a single presentation" (Fisher, 1978, p. 115).

Limited emotional control is another problem facing TMH students. They are unable to moderate their feelings and react to situations intensely and unpredictably. The TMH student is rarely pleased by pleasant situations. Special occasions such as parties, outings, and vacations merely cause excitement and overstimulation. As excitement mounts, control then vanishes, and the TMH student needs outside help to bring him back under control. These children often become hyperactive, not sleepy, with fatigue (Fisher, 1978, p. 115).

TMH children frustrate easily, because they are often intelligent enough to be aware of their mistakes. Frustration causes anger which may result in these children exploding at minor irritations and slipping into temper tantrums at the slightest provocation. TMH children can be very difficult children to discipline because they have a reduced sensitivity to both pleasure and pain. Physical punishment and the deprivation of privileges have no lasting effect (Fisher, 1978, p.115).

The trainable mentally handicapped student most often cannot inhibit his response to a stimulus. There is generally no mediation of reason, no use of judgement, or anticipation of consequences from a given action. These students do not stop long enough to remember past experiences. For example, a TMH student could light a match, because it was available and only later remember that he was warned against lighting matches. A TMH student may lie or steal because of the temptation of the moment with no thought of future repercussions (Fisher, 1978, p. 116).

Motor control is also limited for these students. They cannot repress the urge to move resulting in an all-pervasive restlessness. This restlessness may not be a problem at home, but when he arrives at school the restlessness could create a problem. School demands sustained periods of immobility and a level of self-control that most TMH students do not have (Fisher, 1978, p. 116).

Curriculum Design

Upon researching parallel studies of TMH curriculum projects, several common points arise with respect to curriculum design. Handicapped students should have access to a wide range of growth-promoting experiences. The basic orientation of curriculum should be developmental. Teachers should attempt to strengthen abilities which are already evident and to stimulate the precursors of functions which are embryonic or latent. The instruction of material should be paced by the student not pushed by the teacher. Techniques of behavior analysis and precision teaching should be instituted where they are most appropriate. These techniques are especially applicable in enabling a child to establish self-help skills and to control his own activity (Sapir and Wilson, 1978, pp. 185-186).

The TMH child should be encouraged to try, and effort, as well as "success", should be noted and acknowledged. New tasks and lessons should be introduced by the teacher and presented according to a plan with every opportunity for the children to observe and discover (Sapir and Wilson, 1978, p. 186).

Trainable, mentally handicapped children should be encouraged to enjoy their schooling and to learn to like as many different kind of activities as possible. Children should also learn to enjoy being alone and learn to enjoy sensory phenomena - tasting, feeling, smelling, listening (Sapir and Wilson, 1978, p. 186).

Sapir and Wilson (1978) state that handicapped children

> should be assisted in every possible way to come into contact with the world about them and to share the common experiences of childhood with their age-peers, with their parents, with their teachers, and with all others whose lives they touch (p. 186).

Mossman (1972) states another set of ideas to keep in mind.

1. Practical learn-by-doing approach is emphasized, theoretical study is minimized.
2. Positive "you can do it" approach is stressed.
3. Sequence of skills or operations is presented at a slower pace compared to a regular program.
4. Reinforcement by repetition is the recommended practice.
5. There is no ceiling on achievement; each pupil may ascend the heirarchy of skills to the limit of his ability (p. 13).

Meyen (1968) identifies six areas of consideration when developing curriculum for handicapped students.

1. Teach the unit, don't talk the unit.
2. Plan unity and record successes and failures of the activity.
3. Always have an alternative activity which you can bring in at a moment's notice.
4. Be prepared to switch the activity at a moment's notice.
5. Make the initial lesson motivating. Be an opportunist in capitalizing on experiences the children have had.
6. Follow each lesson with meaningful seatwork or small group work that can be

carried out with a minimum of direction by the teacher (p. 26).

Another approach to keep in mind with regards to curriculum development is put forth by Rosenshine and Furst (1973). They state:

1. Be Goal Oriented - If teachers goals were found to be task-oriented or businesslike, there was a high correlation with student achievement.

2. Provide Success - Success can improve motivation, attitudes, academic progress, and classroom behaviour.

3. Be Flexible - Vary the teaching procedures to maintain a problem - solving approach to teaching.

4. Be Organized - All materials should be readily accessible, classroom rules must be specified, assignments must be defined accurately. Special education students need structure for establishing much needed classroom routines.

5. Be Positive - When the teacher is cheerful, supportive, and enthusiastic students tend to model his actions and attitudes.

6. Strive To Motivate - Many handicapped students need support and encouragement from others to sustain interest in schoolwork.

7. Insure Attention - Attention is an essential factor in the learning process and teachers should try to strengthen students attention behaviour.

8. Provide Feedback - Without feedback, the student is unable to determine whether a response is correct or incorrect.

9. Enjoy Teaching - Students can bring enjoyment to teaching. Teachers should develop an attitude of appreciation and expect to enjoy his students (Mercer and

Mercer, 1981, pp. 16-18).

Finally an approach put forth by Neff and Pilch (1976) identifies eleven major approaches.

1. Be Kind but Firm and Consistant - Simple rules for acceptable conduct which are consistently enforced with kind firmness will do a great deal to help children know what the limits are. Rules must be clearly stated and consistently enforced.

2. One Step at a Time - Children when experiencing difficulty have trouble remembering and following a series of directions. Make sure you give adequate time for the completion of each step.

3. Use a Minimum of Language - Instructions must be clear, simple and directly to the point. Too many words can lead to confusion. Handicapped students are unable to pick out the necessary information.

4. Work from the Concrete to the Abstract - An opportunity to manipulate concrete objects makes it easier for the student to deal with the abstract concepts.

5. Provide Many Short but Frequent Repetitions - Many short repetitions of a task scattered throughout the day are better than long periods of repetition given less frequently.

6. Expect Ups and Downs - Learning does not proceed in an orderly, and uphill direction. Learning will spurt ahead one moment and be on a plateau the next. This is more evident of children with special learning problems.

7. Control the Quality of Work and Length of Work Period - Mentally handicapped students can usually work for relatively short periods of time.

8. If a Strategy Does Not Work, Change It - If students are not able to achieve objectives, go back to your analysis of

the task and look at the kind of errors that keep occuring. Never let a student fail. Continue trying until the student finds success at his or her optimum level.

9. Do Not Allow Children to Practice Their Errors - Many children with learning problems tend to repeat the same error over and over, unless the pattern is broken. Sometimes it may be necessary to stop the activity and come back to it later because once an error is allowed to continue it will most likely be made throughout the assignment. Unlearning will have to take place before new and proper learning will take place.

10. Feedback Is Essential - Feedback between a teacher and student is a necessity. Children with learning problems need as much feedback as is possible to give. Give feedback as soon as the task is completed or whenever an error occurs. Always keep the feedback positive.

11. Organization and Management - Teachers mith many handicapped children in their classes may do some things to become better organizers and managers. One, is to team up with another teacher to share each other's skills. Two, is to use older children, or children who do not experience the particular problem, in the class as tutors. Three, is to use parent volunteers in the classroom. Four, is to turn the activity into small group activities as opposed to individual activities as other children may have the same problems (pp. 73-83).

Many approaches to teaching the mentally handicapped have been presented above. The curriculum studies researched thus far have also implied that basically no one approach will work for each trainable mentally handicapped child and no specific approach will work for all teachers. When planning a curriculum

for TMH the best way to solve the problem is to develop an individual student profile on the student and then develop individualized units of instruction for these students.

Teaching Strategies

Several teaching strategies are put forth in the literature available. Of these there are five that stand out and are discussed here.

Behavioristic Task Analysis Engelmann (1969) gives the best perspective of these teaching strategies.

1. Educational objectives must be stated as a series of specific tasks.
2. Everything that follows--the analysis, the development of specific teaching presentations, and the teacher's behaviour--must derive from the objective tasks.
3. The analysis must be made by noting every concept needed for successful performance of the tasks.
4. Tasks that teach these concepts must be specified.
5. Each presentation designed to teach a given concept must admit of one and only one interpretation.
6. For clarity and maximum feedback of information from the performance of children, the program should be designed so that the child learns one new concept at a time.
7. The teacher must infer from the children's performance whether they have mastered a concept; must provide

appropriate remedies for children who have developed misconceptions or inadequete formulations of a given concept; and must recognize that the teacher deals only in concepts and that the child's responses must be interpreted in terms of concepts.

8. The program must be evaluated in terms of whether the children meet the various criteria of performance specified by the objectives (Gearheart and Litton, 1979, p. 90).

Following this philosophy, Brown, Bellamy, and Sontag (1971) propose a specific instructional model whereby educational tasks (terminal objectives) are broken down into component parts and taught. Specifically there are six component parts of the model.

First, the teacher must specify terminal objectives in behaviouristic terms. That is, she must convert the required criterion performance into observable responses.

Second, the teacher must analyse the criterion responses and divide them into a series of less complex responses.

Third, the teacher must arrange the responses she decides are necessary for completion of the terminal response into a series.

Fourth, the teacher must teach or verify the existence of the student's ability to perform each response in the series.

Fifth, the teacher must teach the students to perform each response in the series in serial order.

Sixth, in an attempt to delineate successes and failures, the teacher must record student performance during each training phase so that adjustments can

be made during the teaching process (Gearheart and Litton, 1979, p. 90).

Clinical-Prescriptive Teaching The goal of clinical or prescriptive teaching is to tailor learning experiences to the unique needs of an individual child. It relies on extensive diagnosis, an educational prescription written from the diagnosis, and continous evaluation and modification.

Learner (1976) identifies the phases of clinical teaching as (1) diagnosis, (2) planning (of the teaching task), (3) implementation (of the teaching plan), (4) evaluation (of student performance), leading to modification of the diagnosis (Gearheart and Litton, 1979, p. 91).

Two additional factors are important in the clinical teaching approach: (1) manipulation of learning variables, and (2) establishing theraputic relationships (Gearheart and Litton, 1979, p. 91).

There are six environmental factors that can be controlled in the clinical-prescriptive learning environment.

1. Space - the physical setting or work area. A nondistracting environment may be necessary for certain students.
2. Time - the length of lessons. For a child with a very short attention span, concise, short lessons may be advisable.
3. Multiplicity variables - the number of factors a child must manipulate in a task. Included are the number of pieces

of work, extraneous material, and modality channel (visual-auditory, and so forth).

4. Difficulty - of the tasks involved. The key here is to present challenging tasks but within present ability level.

5. Language - on the part of the teacher. Communication by the teacher should be direct, simple, and meaningful. It may be helpful for some children to touch or maintain visual contact when talking.

6. The interpersonal relationship factor - between child and teacher. This relationship is of great importance to learning, and teachers must establish this rapport (Gearheart and Litton, 1979, p. 91).

As seen the clinical-prescriptive approach implies a concept about instruction and requires flexibility and continuous evaluation by the teacher.

Montessori

Maria Montessori based much of her work on the efforts of Itard and Seguin. The Montessori method follows the guidance of the natural physiological and psychological development of the child. Her method is divided into three parts: (1) motor education, (2) sensory education, and (3) language. The care and management of the environment affords the principle means of motor education, whereas sensory education and the education of language are provided by didactic materials.

Montessori's (1912) ten rules of education are:

1. Children must be approached differently from adults.

2. Learning comes from within and is spontaneous.

3. Children need a childhood environment that stresses free play, games, and colorful materials.

4. Children like order.

5. Children need freedom of choice.

6. Children like silence.

7. Children want to work.

8. Children like repetition.

9. Children cannot be expected to perform our every command.

10. Adults use themselves to perfect their environment, whereas children utilize their environment to improve themselves (Gearheart and Litton, 1979, p. 94).

The Montessori approach presents several advantages.

1. The carefully developed tasks and materials provide a maximum probability of success, are interesting and attractive, and emphasize persistence.

2. The Montessori method provides practical life exercises in an orderly environment.

3. The allowance of self-initiated work encourages the retarded child to start and finish work on his own.

4. The optimistic working assumptions of this method allow the teacher of the TMR to view each child as having developmental potential. The child's strengths should be discovered so that he can develop a good self-image and a sense of competence (Gearheart and Litton, 1979, pp. 94-95).

Competency-Based Instruction Competency-based instruction requires that specific behavioural objectives be defined, activities provided to meet the stated objectives, and proficiency assessed following instruction. The most important part is the statement of objectives. An objective refers to any measurable activity displayed by the learner, and an objective is any statement of what the learner is to be like when he has successfully completed a learning experience. A behavioural objective is, then, an objective that is observable or measurable after the student has undergone a learning experience.

For a behavioural objective to be well written it must answer these six questions.

1. Who is going to perform the behaviour?
2. What behaviour is desired?
3. What instructional variable is desired?
4. How will the behaviour be measured?
5. What is the length of time required for performance of the behaviour?
6. What is the proficiency level expected? (Gearheart and Litton, 1979, p. 93).

After writing behavioural objectives, learning activities must be provided that correlate with each specific objective. The desired behaviour after completion of the learning activities must be objectively or subjectively measured and observable.

A competency-based approach has the advantage of requiring teachers to finitely define what it is and how they want to teach a student, and it objectively determines if the stated goals, via the behavioural objectives, have been met.

Piagetian Model

Central to Piagetian theory is the cognitive process, or development of intelligence. Intelligence as seen by Piaget is an adaptive process. The individual develops his intellect by continuous interaction with the environment. This interaction is a complementary, two-fold process called assimilation and accommodation.

Assimilation corresponds to inner organization and occurs when an individual incorporates something from his or her environment into their mental structures. Accomodation is outer adaptation and occurs when environmental conditions require a necessary adaptation of existing mental structures to reality.

Schemas are another important aspect of Piagetian theory. A schema is a behavioural manifestation of the structures of the individual's mental equipment. Schemas tend to be repeated when the individual is confronted with a similar situation, and this repetition produces better integrated, more stable schemas.

The stages can be defined by the following criteria:

1. A stage is a period of attainment or organization of mental operations.
2. The attainment of one stage serves as the starting point for the next.
3. The order of the stages is constant.
4. Thought structures of earlier stages are integrated in or become a part of the later structures (Gearheart and Litton, 1979, pp. 97-98).

Indhelder and Woodward worked on relating Piaget's theory to mental retardation. They developed the following conclusions from this research.

1. The stages postulated by Piaget are applicable to the mentally retarded but at a slower pace.
2. The reasoning ability of young normal children was the same as that in older mentally retarded children.
3. As normal children passed from one stage of reasoning to another, the progress became more rapid; an opposite effect was observed in the mentally retarded.
4. Traces of a previous level persisted much longer in retardates than in normal children.
5. The severe and profound level of retardation fixated or did not progress beyond the sensorimotor operations stage, the TMR [trainable mentally retarded] at the intuitive stage, and the EMR [educable mentally retarded] at the concrete stage (Gearheart and Litton, 1979, p. 98).

Piaget's work has several implications for teaching mentally retarded children.

First, since the process of learning is enhanced by active involvement, students should be encouraged to interact concretely with the material to be mastered.

Second, since Piaget's emphasis is on the process rather than the answer, the teaching emphasis should be on the methods used by the student in obtaining a solution, not on the correctness or incorrectness of the solution.

Third, since learning by individuals occurs in part by social interaction with adults and peers, many opportunities of this type should be provided.

Fourth, since children operate at particular developmental stages, these stages should be behaviourally assessed, and objects and activities provided that promote full development.

Finally, the notion of cognitive development proceeding in an orderly, step-by-step sequence implies that the teacher should be sure the child masters each stage of development before advancing to the next.

One of the most important contributions of the Piagetian approach to mental retardation may well be the shift of emphasis to what the retarded person is or can do rather than what he cannot do. This positive approach enables us to shift from the "defect" or "deficit" concept to a developmental, performance-based cognitive approach (Gearheart and Litton, 1979, p. 99).

In deciding upon a specific teaching approach a

school or school district must examine each approach, as each has its advantages and disadvantages. Only then can the school or school board decide on a specific teaching approach that realistically meet the needs of the TMH student.

General Goals

The literature provided two directions of thought with regard to goals. The first is presented by the Florida State Department of Education, 1971.

There are three main goals: (1) preparing for work, (2) choosing and getting a job, and (3) responsibilities, rights and benefits of the worker. From these goals come several sub-goals and these will be presented below.

I. Preparing for Work

A. Positive attitudes toward work.

B. Refines good work habits.

C. Develops work skill.

D. Is aware of his strengths and limitations which affect the job.

E. Has knowledge of social habits and attitudes to deal effectively with employers during job interviews.

F. Has knowledge of social habits and attitudes to deal effectively with peers and employers while on the job.

II. Choosing and Getting a Job

A. Understands that people work for a living.

B. Becomes aware of jobs he can and will be able to perform in the community.

C. Has necessary learning for getting a job.

III. Responsibilities, Rights, and Benefits of Worker.

A. Knows most of the responsibilities to employers and fellow employees.

B. Knows most of the rights that are involved in assuming a job.

C. Knows most of the benefits that are involved in assuming a job (pp. 36-38).

Another approach to goals for a TMH program was put forth by Menomonie Public Schools in Wisconsin in 1977. It first identifies several work behaviours for the TMH student to recognize before potential employment can be attained. These are punctuality, instructional response, co-worker interaction, consistency, tolerance, reaction to supervision, correction of error, socialization and clean-up (p. 71).

Menomonie Public Schools then identified some skills that the TMH student needs to obtain before specific job training or placement can take place. These are:

-color discrimination
-shape discrimination
-size discrimination

-gross motor coordination
-manual coordination
-rhythm
-perceptual motor skills
-one step manual operation
-multiple step operation
-finger dexterity
-bi-manual coordination
-eye-hand coordination
-eye-hand-foot coordination
-whole body range of motion
-strength and endurance
-balance
-subnormal physical conditions
(noise, heat, body position etc.)
-safe handling of tools
-maintenance of assembly line
-one-step manual operation
-multiple-step manual operation
-one-step repetitious operation, hand tools
-multiple-step operation, hand tools
-one-step repetitious operation, power tools
-multiple hand tools in an operation
-multiple power tools in an operation
-number of variables in an assembly
-sequential machine operation and set-up
-personal service to public (p. 73).

Next the school board identified which skills belonged to each educational domain and expanded on the skills. It was mentioned that acquisition of skills is not necessarily achieved by a process of progression through levels within each domain. In the list to follow developmental levels within each domain are not identified.

Affective	Psychomotor
-punctuality	-rhythm
-instructional response	-perceptual motor
-co-worker interaction	-gross motor coordination
-consistency	-manual coordination
-tolerance	-finger dexterity
-reaction to supervision	-bi-manual coordination
-correction of error	-eye-hand coordination

Affective

-socialization
-balance
-clean-up
-personal service, public
-physical conditions
-personal service, public

Psychomotor

-eye-hand-foot coordination
-whole body range of motion
-strength and endurance
-one-step manual operations
-one-step repetitious operations, hand tools
-one-step repetitious operation, power tools

Cognitive

-color discrimination
-shape discrimination
-size discrimination
-number of variables in sorting
-safe handling of tools
-maintenance of assembly line
-one-step manual operation
-multiple-step manual operation
-one-step repetitious operation, hand tools.
-multiple-step operation, hand tools
-one-step repetitious operation, power tools
-multiple-step operation, power tools
-multiple hand tools in an operation
-multiple power tools in an operation
-number of variables in an assembly
-sequential machine operation and set-up (p. 74).

The literature review indicated that very little has been written on the goals of trainable mentally handicapped programs.

Choosing and Evaluating Resource Material

Archer and Edgar (1976) state that the teacher has three options in choosing materials: (1) adopt a commercial material and use it as designed, (2) adapt a commercial material to fit the instructional needs of a specific student, or (3) make materials (p. 75). Since

the passage of P.L. 94-142 (Hickman and Anderson, 1979), there has been an increase in the production of commercially available material for the education of the handicapped (p. 75). Unfortunately, most of this new material is not accompanied by any field test data or research data supporting their effectiveness.

Archer and Edgar (1976) present a plan to be used in purchasing commercially available materials.

1. Identify the curriculum areas in which materials are needed.
2. Rank the areas from highest to lowest priority.
3. List affordable materials that are designed to teach in the selected area or areas.
4. Obtain the materials and evaluate them so that a decision can be made regarding a purchase (p. 75).

There are three major factors involved with material evaluation. These are (1) general information, (2) characteristics relating to teaching, and (3) characteristics relating to classroom management.

General Information

1. Name of the publisher
2. Major skill concentration
3. Cost and durability
4. Target age
5. Research and field test data

Characteristics Relating to Teaching

1. Sequence of skills
2. Organization of material, including considerations for individualization
3. Clarity of directions
4. Task levels
5. Stimulus-response modality combinations
6. Pace of content presentation

Characteristics Relating to Classroom Management

1. Evaluation and data recording
2. Space requirements
3. Time requirements
4. Extent of teacher involvement
5. Interest level
6. Reinforcement (p. 75).

When the teacher has selected instructional materials, the next task is to organize and use them efficiently. Teacher made and commercial materials must be organized in the classroom so that students can easily locate, use, and return them (Mercer and Mercer, 1981, p. 79).

The St. Albert Protestant Separate School District No. 6 attempts to insure that TMH students receive instructions in self-care, appropriate use of leisure time, social and emotional development, fitness, job and vocational skills as well as applied academics.

The emphasis of this program will be on independent life skills and job readiness. Traditional academic subjects will be taught with a practical emphasis.

Objectives

1. To meet individual development needs of students,

2. To prepare students for working world expectations,

3. To provide positive and reinforcing encounters with regular students, and

4. To allow students to achieve their maximum potential socially, emotionally and academically (St. Albert Protestant Separate School District No. 6, 1981, p. 29).

Summary

The review of related literature has discovered little material, if any, in the areas that deal with curriculum or curriculum design, trainable mentally handicapped, and/or industrial arts or industrial education. However, what has been written seems to have some application regarding methods by which the TMH child could be taught.

CHAPTER 3

METHODOLOGY

The findings from this study turned up some interesting approaches that can be used, generally, with TMH students in industrial education.

Trainable mentally handicapped students function quite well with repetitive jobs. Where students in regular stream classes may need only two or three repetitions to learn a given task, the TMH student may take up to an average of fifteen times to learn the same task. The TMH student may not be capable of learning certain tasks at all, depending on the severity of the mental handicap.

Instrumentation And Methodology

After reviewing the literature, the task analysis approach was used for the first stage of development of an industrial education curriculum for trainable, mentally handicapped students. Second, the principals of the four junior high schools of the St. Albert Protestant Separate School System were contacted and special education programs operating in their schools was identified. Third, was to interview specialists in the field of trainable mentally handicapped students. Other methods used to obtain information on trainable

mentally handicapped students and possible curriculum materials are listed below. The author

1. Identified all junior high schools in the St. Albert Protestant Separate School District No. 6 with special education programs operating within them.
2. Identified all special education programs found in operation at these schools.
3. Identified the major learning difficulty characteristics and specific personal characteristics of these trainable mentally handicapped students in industrial education.
4. Surveyed literature on trainable mentally handicapped students in industrial education.
5. Contacted the department in charge of curriculum for the St. Albert Protestant Separate School District No. 6 as this will provide more access to contributors.
6. Approached the St. Albert Protestant Separate School District No. 6 school board personnel to request the purchase

of any appropriate curriculum materials.

7. Reviewed the dissertation abstracts for information.
8. Reviewed the eduction index for information.
9. Used the thesaurus of Eric descriptors and determine the descriptors for special education, specifically trainable mentally handicapped and industrial education.
10. Searched the Eric system.
11. Searched the Lockheed system.
12. Identified research laboratories in the United States under the Department of Health and Welfare that deal with industrial education and special education.
13. Wrote to these laboratories requesting information on their work.
14. Obtained catalogs from the Center for Vocational Education at Ohio State University.
15. Reviewed the American College for Industrial Arts Teacher Education abstracts.
16. Contacted the special education resource person in the St. Albert Protestant

Separate School District No. 6. This could lead to identification of resource persons in other school districts in Alberta.

17. Contacted key resource personnel in the Alberta Department of Education. This could lead to identification of resource persons in other provinces in Canada or in different states of the United States of America.
18. Search and identify parallel studies on industrial education and special education. This could be from computer searches or journal searches.
19. Develop a specific curriculum for the education of these special students in industrial education.

An outline of the special activities teachers could use to present valid and meaningful educational experiences to these students might include identifying media resources that could be used with success.

Letters were written to the institutions or schools directly, in major cities across Canada and the United States where special education programs in industrial education are operating asking for materials or information pertinent to the objectives of the

thesis. The names and addresses for these institutions appear in appendix 5.

The St. Albert Protestant Separate School District No. 6 has been contacted about cost sharing the purchase or reproduction of any such materials.

The methodology used to provide an evaluation system to determine the appropriateness of gathered materials in meeting the objectives and operational guidelines of the junior high special education programs of the St. Albert Protestant Separate School District No. 6 was developed. The instrumentation will be validated by key personnel of the school district before being implemented. Then using materials that meet the criteria, a curriculum will be developed for the trainable mentally handicapped in industrial education.

A sample of the letter requesting information can be found in the appendix 1.

Principles For The Development Of The Curriculum

After reviewing the literature, identifying several concepts for curriculum design, and identifying some specific teaching strategies it was discovered that the approach several articles and some books take is that of task analysis.

Task Analysis

The task analysis approach has been on "identifying and sequencing a set of tasks to be learned in some instructional program" (Bellamy et al, 1979, p. 65). Bellamy goes on to explain that task analysis is defined as:

1) breaking a task down into its component responses,
2) listing these responses and the stimuli that should ultimately come to control them, and
3) identifying a criterion for each response (Bellamy et al, 1979, p. 65).

Task analysis prepares a teacher in three important ways:

1) The trainer performs the task several times and thus becomes familiar with the task demands before training begins.
2) The trainer defines a specific response chain, which remains constant from training trial to training trial.
3) Task analysis requires the trainer to define operationally each response the worker will be expected to perform (Bellamy et al., 1979, p. 65).

By doing task analysis the uncertainty of whether a particular response is given correctly during training is reduced to a minimum. This approach also allows the teacher or trainer to provide consistent positive feedback to the student on his or her performance (Bellamy et al., 1979, p. 65).

Task analysis also allows the teacher to collect data on student behaviour. Only after data has been

collected can the teacher attempt to provide the needed positive feedback or reinforcement that a TMH student needs. By performing task analysis the teacher is then able to assess the appropriate starting level for each student. This is done by recording accurately the number of steps the child completed independently. Each child may have his or her own level of entry into a task that is different from any other member of the class. Starting each student at the appropriate level "minimizes the likelihood of teaching skills that are either too simplistic or too advanced (Wehman, 1979, p. 88). Task analysis also provides the teacher with:

> a more systematic means of evaluating the effectiveness of a program because it provides an objective measure of how many steps were taught once instruction began (Wehman, 1979, p. 88).

Constructing a Task Analysis

Bellamy outlines six steps that are necessary when completing a task analysis. Each of these will be discussed in greater detail later. These are:

1) The person who will be doing the training should construct the task analysis.

2) The trainer should perform the task several times exactly the way the worker will be expected to perform it.

3) Break the task down into its functional response units. List these in the order they will be performed.

4) For each step in the chain identify and list the stimulus that should function as the Discriminitive Stimulus (S/D) for the step.

5) Review the steps of the task analysis to ensure that similar S/Ds do not cue different responses.

6) Use the sequence in the task analysis to construct a training data sheet (Bellamy et al., 1979, pp. 67-71).

The teacher is the individual who will be evaluating the effectiveness of the training and is aware of all the correct responses needed to determine successful training. Also the teacher is aware of all incorrect responses generated by the student, which are the ones the teacher needs to attend to. So it follows that the teacher be responsible for working directly by developing the task analysis.

With respect to the trainer performing the steps of the task many times over, it is critical that the teacher become entirely familiar with the specific responses expected of the student. This way the teacher can elicit the next appropriate stimuli in the task analysis. As well, the teacher can not recognize or make small changes in the specific steps of a task without first becoming completely familiar with these steps themselves. A trainer must not depend on the students to make minor variations in the way the task is performed as this most often is not the most efficient way of completing the steps in a task analysis. Therefore, it is imperative that the teacher who designs the task specifications also become

proficient in carrying out the same steps he/she expects of their students (Bellamy et al., 1979, p. 67).

By breaking the task down into its functional units and listing them in the order they will be performed, these response units actually comprise the specific steps needed to complete the task. The difficulty, however, is deciding how big or small each task should be. The size of each step will ultimately depend on the difficulty of the task and the skill level of the learner. When dealing with handicapped individuals, Bellamy identifies "functional response units". Functional response units are the sequences of behavior that result in distinct observable changes in the item being worked on. In other words, Bellamy states that "Functional response units are observable behaviors that the worker is expected to perform" (Bellamy et al., 1979, p. 68). The behavior unit should then be listed and defined in a clear, concise manner. Davies suggests task analysis steps be written so that each step:

1) is at the same level of generality as all other steps;
2) is written in the form of a simple, declarative (Kernal) sentence;
3) avoids negatives, qualifications, and conjunctions;
4) possesses only one active verb; and

5) is critical and essential to the task (Bellamy, 1979, p. 68).

Bellamy further adds that the sequences of a task analysis to not always fit that of a simple linear chain. That is, the student may encounter an "if-then" situation after performing several sequential steps. This is called branching and the task analysis should indicate such branching. Bellamy also states that

> The steps should be large enough (contain enough behavior) to be a meaningful representation of what a worker may need to learn and yet small enough to adequately index progress during training (Bellamy, 1979, p. 69).

Bellamy (1979) believes training involves more than teaching a student how to perform certain responses. It involves "teaching him or her when it is appropriate to emit each behavior" (p. 69). He also believes a task analysis should index both the "responses to be learned and the stimuli that will "control" each response when training is completed" (Bellamy, 1979, p. 69). By specifying the stimulus for each response, a teacher will also be specifying the criterion for the preceding response. The criterion for a response, therefore, is the outcome that should result from the student performing the response correctly. The criterion for one step is usually the stimulus for the next step (Bellamy et al., 1979, p. 70).

If two very different stimuli control different responses, the worker, most often, has difficulty determining which response to emit when either stimulus is present. When this situation occurs Bellamy suggests that the task design must be changed so that the learner has very distinct cues (stimulus) for each response expected. Bellamy further believes that to avoid confusion the trainer or teacher should continually "review a task analysis to ensure that different responses are cued by clearly different [stimuli]" (Bellamy, 1979, p. 71).

When working effectively with task analysis, the teacher should allow a great deal of the student behaviour to be controlled by worker performance. Assistance should be given as a result of worker errors and reinforcement should be given as a result of worker success. To properly effect assistance or reinforcement, a teacher should always be collecting data on student performance by monitoring observable responses of the student. Bellamy feels that it is of prime importance that the teacher be able to respond to day-to-day patterns of learner performance. Also he feels that it is of prime importance that the trainer have a method of indexing progress of student response on a day to day basis. With this data the trainer will know when to make decisions such as a change in task design, or when to alter methods of assistance, and so

on. To do this, Bellamy uses a task analysis data sheet developed by Saunders and Koplik (1975) as an efficient and effective method of collecting such data. Quite simply a data sheet is constructed by listing the stimulus and responses that make up the steps of a task analysis. The tasks a learner will perform are listed on the left with the first step to be performed on the top and the last step to be performed on the bottom. Numbers are then added on the right side with the desired responses in the middle. The numbers are numbered with the number 1 at the bottom and increasing as the first step is reached. The number of columns on the right would contain as many trials as necessary. The first row would be the first trial, the second row the second trial and so on. Training should be done for 10 to 30 minutes with no data collection. As the learner tries the individual steps for the first time, a slash is placed through the number corresponding to the step that the student responds to, correctly and independently. Training should be done again after 20 to 30 minutes and another trial done. This procedure would continue for four or five trials to obtain data on a given student for steps of a task. The number of independently completed steps for each trail is then circled and the circles are then joined with a line. This creates a student profile graph for a typical set of steps necessary to complete a task, as shown by

Figure 1 which is taken from Bellamy (1979, p. 74).

Bellamy (1979, p. 71) lists several advantages to collecting data with this type of data sheet. First, it allows the trainer to collect and graph raw data on the same page. Second, data does not need to be collected on each training trial; hence, the trainer can focus his or her full attention on the worker during training. Third, the ease of data collection increases the possibility that trainers will be willing to use the data sheet; thereby, increasing the probability that the data will be available for making training decisions and evaluating worker performance. Fourth, the data sheet allows for easily interpretable, visual inspection of the data; hence, the information it provides is instantly obtainable and more likely to be used. Fifth, since the data sheet indexes small gains in worker competence, it may serve as a reinforcer to trainers. Finally, the data sheet can be extremely useful when a trainer is trying to obtain consultation from other trainers or supervisors. Difficult steps can be readily identified and descriptions of a learner's progress (or lack thereof) can be quickly translated into quantifiable terms (Bellamy, 1979, pp. 73-74).

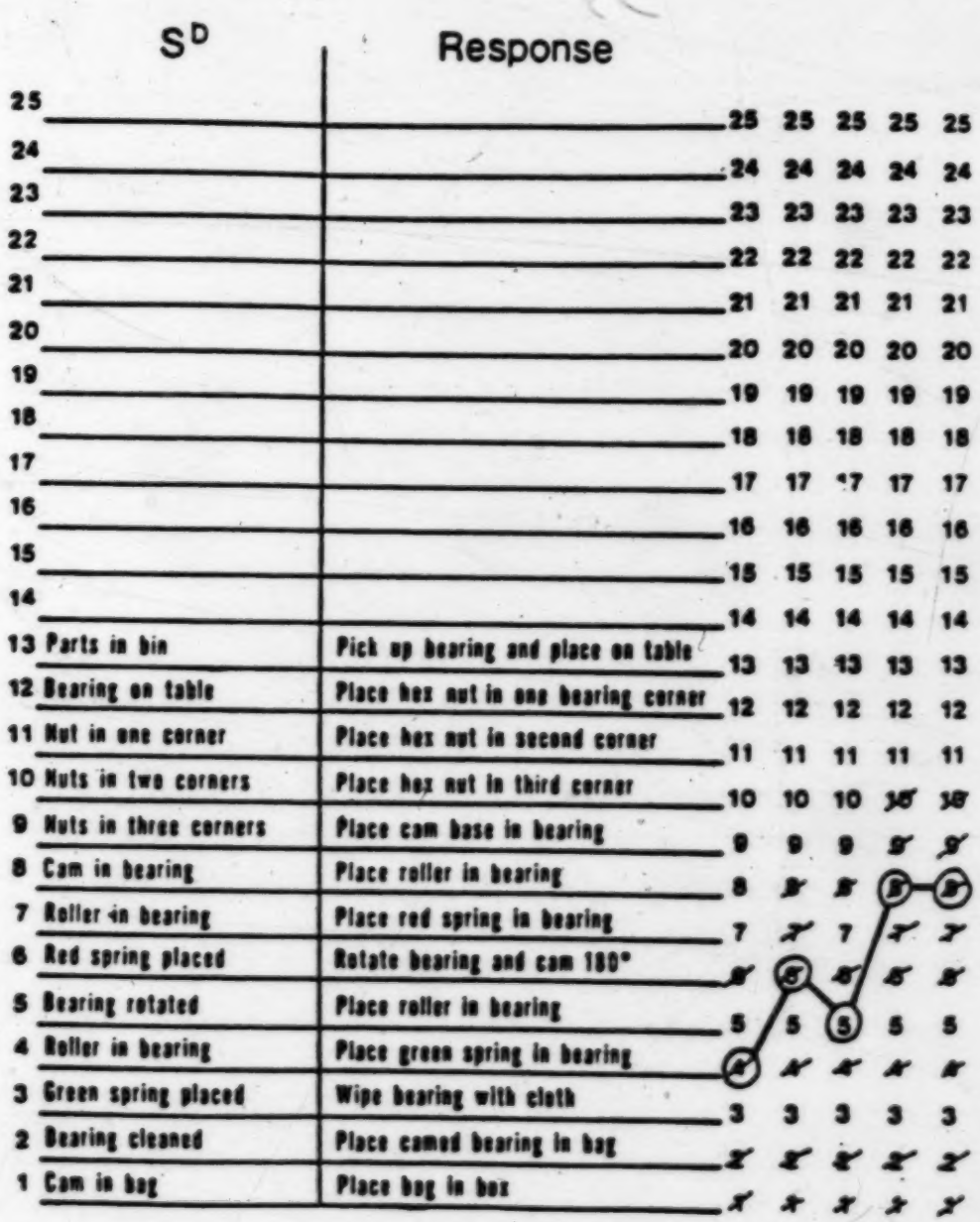

Figure 1. A Typical Task Analysis Data Sheet

From: (Bellamy et al., 1979, p. 74).

CHAPTER 4

CURRICULUM FOR TRAINABLE MENTALLY HANDICAPPED

The following curriculum was developed, after considering the material discovered from doing the review of the literature, curriculum design models presented, teaching strategies presented and the experience of the author. The experience of the author means that the majority of activities were tested on the class of students the author teaches at a junior high school.

The following curriculum will be presented in outline form and then presented in detail later.

I Career Education

a. Job seeking skills
b. Interview skills
c. Job related skills
d. Work performance skills
e. On the job skills
f. Union/Management skills
g. Time clock
h. Money management

II Safety

a. What is safety
b. Safety is an ongoing process
c. Power tools
d. Hand tools
e. Walking to get tools or supplies
f. Clean-up safety
g. Safety entering and exiting class
h. Safety at the time clock

III Power Tools

a. Safety
b. Operations
c. Processes
d. Supervision
e. Power Tools For Use

i Band Saw
ii Disk Sander
iii Orbital Sander
iv Belt Sander
v Drill Press
vi Electric Hand Drill
vii Buffer
viii Vacuum Former

ix Injection Molder

x Electric Soldering Iron

IV Hand Tools

a. Safety

b. Operations

c. Processes

d. Supervision

e. Hand Tools For Use

i Hammer

ii Screwdriver

iii Files

iv Wood Rasp

v Back Saw

vi Wood Chisel

vii Clamps

viii Ruler

- Centimeter

- Millimeter

ix Squares

x Planes

xi Vise

xii Wrench

xiii Utility Knife

xiv Tin Snips

xv Staple Gun

xvi Pliers

xvii File Card

xviii Brace and Bit

xviv Hack Saw

xx Scissors

xxi Mallet

xxii Leather Stamps

xxiii Revolving Punch

xxiv Swivel Knife

V Hand Operated Equipment

a. Miter Box

b. Box and Pan Brake

c. Di-Acro Circle Bender

d. Strip Heater

e. Frying Pan

VI Supplies and Materials

a. Wood

b. Plastic

c. Metals

d. Leather

e. Sandpaper

-types

-grades

f. Screws

g. Nails

h. Glue

i. Finishing Materials

VII Other Equipment such as time clock

VIII Computation

a. Addition

b. Subtraction

c. Multiplication

d. Division

IX Following Directions

a. Authority figures

b. Supervision

The detailed curriculum is to follow. First the major section will be identified with the Roman numerals included in the heading. The sub-headings will then be identified with the specific objectives and/or task analysis where applicable.

Time restraints, cooperation with the homeroom teacher, facility restraints and budget restraints may limit the teacher from completing each specific objective

as outlined in this curriculum guide. Any of the items may or may not be included in the regular curriculum for the TMH student so if they appear in this curriculum, then the teacher may wish to include them as a review. In any case, these specific objectives should be used to re-inforce the curriculum used in the education of the TMH student.

I. Career Education

Career education plays a major role in the education of the trainable mentally handicapped student.

a. Job Seeking Skills

Job seeking training includes helping the student to learn about such things as people and agencies with job opening information, employers, advertisements, qualifications for the job, applications and resumes.

1. Given only verbal instructions, the student will identify five sources of employment information, within five minutes, on three of four occasions.

   Answers may include any of the following: employers, friends, relatives, newspapers, radio, television,

Department of Employment and Immigration or employment agencies.

2. Given only verbal instruction the student will identify three places that have job openings, and write down the employer's name, address and/or phone number, and the type of job within five days.

   The employer's name, address or phone number and type of job must be written correctly.

3. Given only verbal instructions, the student will create an advertisement for a newspaper of not more than 35 words that includes his or her name, address and/or phone number, that he or she is currently available for work, and identify at least one skill he or she possesses.

   The necessary information must be completed within 35 words and be completed within five days.

4. Given the instructions for placing an advertisement for work in the newspaper, the student will place that ad in the local newspaper.

   The advertisement must be placed in the next available issue of the newspaper.

5. Given the next available issue of the local newspaper, the student will locate his/her advertisement for work on two of three occasions.

6. Given the newspaper classified advertisements with at least ten job openings or on-the-job training notices, the student will point to three different advertisements within five minutes on two of three occasions.

   Each of the advertisements pointed to must be different, and the student must identify the opportunity for employment or training.

7. Given five different descriptions for job openings, the student will identify one skill that is necessary when they work at each particular job within five minutes on four of five occasions.

   The particular skill may be described or demonstrated for each of the five skills found in these descriptions.

8. Given five different descriptions for job openings, and after identifying the skill involved, the student will identify which jobs have the particular skills included in the students' repertoire within five minutes on two of three occasions.

b. Interview Skills

Interview skills are those skills involved with presenting oneself with a favorable and accurate impression in a job interview. Some things to be considered in the interview skills training is dressing appropriately, scheduling an interview, location of the interview, response to questions normally asked of applicants, representing handicaps in an honest but positive manner, gaining information from the employer and presenting oneself favorably.

1. Given only verbal instruction, the student will identify three areas on which an employer evaluates an applicant during an interview within two minutes on two of three occasions.

   The areas may include any of the following: personal appearance, previous work experience, politeness, current skills, education, attitude, personal interests and goals.

2. Given only verbal instructions the student will identify three areas he/she would like to obtain information about the employer and the job within two minutes on two of three occasions.

   Some of the answers may include any of the following: work

qualifications, tools needed, equipment and supplies needed, clothing needed, location of work, income, and fringe benefits.

3. Given only verbal instructions, the student must identify three people who have agreed to be references for him or her, stating their names, addresses and phone numbers on three of three names in less than three minutes.

4. Given a simulated job interview, the student will greet the interviewer with a "Good (Morning, Afternoon); shake hands with him/her and identify him/herself by stating their name within fifteen seconds on two of three occasions.

   The verbal greeting must be appropriate for the time of day, and the hand shake must be with the right hand.

5. Given a simulated job interview of ten minutes duration, and the student with a specific physical handicap, the student will be asked to identify three specific work skills that he/she could do that are part of the job.

   The skills must be part of the job and must be a part of the student's repertoire, and the task must be completed within ten minutes.

6. Given a simulated job interview of ten minutes duration and

the student with a specific physical handicap, the student will be asked to identify three specific work skills that he/she could not do that are part of the job.

The skills must be identified within ten minutes and these skills must be directly related to the student's handicap.

7. Given a simulated job interview of ten minutes, for a specific job, the student is asked to identify at least five specific work skills that you have with machines, tools, or equipment that are used in that specific job.

   The skills must be in the student's repertoire and must be used in the particular job.

8. Given a simulated job interview of ten minutes, the interviewer will ask the student ten different questions related to his/her previous work experience, current skills, education, interests and goals.

   Answers must be in agreement with the information supplied on the application form.

9. Given a simulated interview of three minutes, the interviewer will ask why the student wants the particular job.

The answers given must refer to previous work experience, interest and/or current skills of the student. The answers must be given within three minutes.

10. Given a simulated interview the student will, upon leaving the interview, shake hands with the interviewer, thank him/her for the interview, and state that he/she wants the job.

    The actions by the student must be in order, and the handshake must be with the right hand.

c. Job Related skills

Job related skills are not those skills referred to as work performance skills, but those skills that are necessary for each worker to "get around". These might include locating particular areas, conforming to rules, adapting to the physical characteristics of the job setting, transportation, arrival times, break times, and finishing times to mention a few.

1. Given the following signs: "KEEP OUT", "OFFICE", "EXIT", "MEN", "WOMEN", "DANGER", "PRIVATE", "NO SMOKING", the student will point to the sign that means (1) there is an area that people must stay away from; (2) there is a man's bathroom; (3) there is a woman's bathroom; (4) there is a

way out of the building; (5) there is a place where only certain people are allowed in and no one else; (6) no one can smoke there; (7) there is an area where the secretaries work and the boss works and the files are kept; (8) there is a place which people must stay away from, because it is dangerous.

All eight signs must be identified correctly, each within 60 seconds on three consecutive occasions.

2. Given a specific work location, locker, fire exit, first-aid area, water fountain and supervisor's office, the student will be asked to go from their work station to one of the six locations.

   The location must be correctly identified, and the student must arrive at the location within 60 seconds on three of four occasions.

3. Given a specific work location, locker, fire exit, first-aid area, water fountain and supervisor's office, the student will be asked to go from one of the six locations to their work station.

   The work station must be correctly identified, and the student must arrive at the work station within 60 seconds on three of four occasions.

4. Given the daily starting and ending time of the dinner break, the student will take his/her dinner break at only the allowed time on ten consecutive work times.

5. Given the daily starting and ending time of breaks, the student will take his/her break at only the allowed time on ten consecutive work times.

6. Given the fire alarm, the school bell or other work signal in the place of employment, the student will identify each of the signals and show or tell what to do when each signal is seen or heard.

   All signals must be identified and responded to correctly within two minutes on three consecutive occasions.

d. Work Performance Skills

   Work performance skills include suck skills as setting up the work station, starting work on time, following instructions, sorting and using materials, and staying on task to mention a few.

1. Given a daily starting time the student will be at his/her work station on time each day for ten consecutive work days.

The term 'on time' means no later than two minutes before starting time.

2. Given a specific job assignment or task, some required materials and supplies that are appropriate for the task completion, and some materials and supplies that are not appropriate for task completion, the student will select the materials and supplies that are appropriate for use on ten consecutive work days.

   All the materials selected must be undamaged and appropriate for use on the designated task.

3. Given the specific amount of materials needed for a particular task, the student will bring these materials to his/her work station on ten consecutive work days.

4. Given a daily starting time for the work day, the student will begin work on time each work day on ten consecutive work days.

   The term "on time" means work will begin not later than two minutes after the starting time.

5. Given specified work times, the student will work on-task during working times on ten consecutive work days.

The term "on-task" means to work when he/she is supposed to.

6. Given a specific number of tools for use in a specific task and specific instructions on how to maintain these tools the students will keep the tools clean and maintain these tools, as instructed on ten consecutive work days.

7. Given a specific work assignment and location and a specific amount of time allowed for clean-up at the end of the work shift, the student will clean up his/her work area as instructed on ten consecutive work days.

8. Given specific procedures and a specific location for storing supplies, tools, and equipment, the student will store his/her supplies, tools, and equipment as instructed at the end of the work shift on ten consecutive work days.

9. Given specific procedures and a specific location for storing products and the necessary time to do so, the student will store his/her finished product at the end of the work shift on ten consecutive work days.

10. Given a specific work assignment and a specific duration of time, the student will work on this assignment for the required duration on five consecutive work days.

The exception will be any formal breaks allowed for in the work routine.

11. Given a specific job assignment consisting of a minimum of five specific task responses, the student will work on this work task until completion.

    The quality and rate of work must be acceptable as defined by the instructor.

12. Given a specific job assignment consisting of a minimum of five specific task responses, the student will work on this work task until completion.

    The task responses must be performed in the correct sequence as outlined by the instructor. The quality of work and the rate will be acceptable as defined by the instructor.

13. Given two specific job assignments consisting of a minimum of five specific task responses, the student will work on first one assignment and then the other. The first assignment must be completed before the second assignment.

    The task responses must be performed in the correct sequence as outlined by the instructor. The quality of

work and the rate will be acceptable as defined by the instructor.

14. Given a specific job assignment or task that involves a minimum of two workers performing separate tasks, the student will work on his/her part of the work assignment until the assignment is completed.

    The student's specific job assignment must be performed correctly, and the quality and rate of work must be acceptable as defined by the instructor.

15. Given only verbal instruction and a situation whereby the student is required to borrow a tool or material from another worker, the student will ask the other worker for the tool or material and return it within the specified time limit.

    The student will perform the task on five consecutive occasions, and return the tool or material within the specified time limit.

16. Given a specific task which the client must complete within a specified time, the student will remain on-task and continue working.

    The task must be completed on three consecutive occasions

within the specified time limit.

17. Given a model of an object consisting of a maximum of four parts and given another of the same unassembled, the student will assemble the parts exactly like the model.

    The assembly must be exactly like the model on four consecutive occasions, and the rate of work must be acceptable as defined by the instructor.

18. Given a set of diagrammatic instructions consisting of a maximum of four different steps, the student will perform the steps of instructions until the task is completed.

    The task assignment must be completed in the correct order, according to the instructions on four consecutive occasions, and and the rate of work must be acceptable as defined by the instructor.

e. On-The-Job Skills

On-the-job skills are very important. These are skills which include such things as being friendly towards others, following accepted communication procedures, being able to deal constructively with criticism, refraining from socially destructive behaviours, talking, answering, touching others appropriately, and in general, being an

accepted member of the work staff.

1. Given a specific job assignment or task which involves a minimum of one other co-worker who requires assistance to perform a specific task, the student will ask the co-worker if he/she can help within two minutes on five consecutive occasions that a co-worker needs help.

2. Given a specific job assignment that involves at least one other co-worker, the student is allowed to talk to one or more co-workers in a friendly manner. The student may interact with the co-worker in a pleasant manner, but not so much as to interfere with the co-worker's assignment.

   The behaviour is observed over a ten-day work period and the amount of conversation deemed acceptable is obtained by interviewing other co-workers to see if the student's conversation interfered with their work.

3. Given a specific job assignment that involves at least one other worker, the student will verbally interact with one or more co-workers without yelling or shouting.

   The behaviour is observed over a ten-day work period and the level of conversation deemed acceptable is obtained by interviewing other co-workers to see if the student's conversation was too loud.

4. Given a specific job assignment that involves at least one other worker, the student will touch one or more co-workers in appropriate situations without offending anyone.

   The behaviour is observed over a ten-day work period, and the level of verbal interaction deemed acceptable is obtained by interviewing other co-workers to see if the student's physical contact was ever incorrect or excessive.

5. Given a specific job assignment, the student will not exhibit any offensive habits, nervous habits, or inappropriate behaviours.

   The behaviour is observed over a ten-day work period, and the instructor will state whether any inappropriate behaviour was exhibited by the student or not.

6. Given a specific job assignment, the student will not use profane language under any circumstances.

   The behaviour is observed over a ten-day work period, and whether any profane language has been used will be determined by interviewing co-workers.

7. Given a specific job assignment, the student will use only his/her tools and supplies to complete the job assignment.

The behaviour is observed over a ten-day work period and no incident of theft must be proven to have been committed by the client.

8. Given only verbal instructions, the student will identify by name, and point to the instructor in charge within 15 seconds on five consecutive work days.

f. Union/Management Skills

Union and management skills are concerned with the economic conditions present in the marketplace. These skills deal with verbal and motor behaviours concerned with company policy, obtaining pay, union functions, insurance and benefits, pay periods and amounts.

An appropriate method of instructing this area would be to set up a simulated company with company policy, a union, a time clock, some artificial pay and checks, an artificial bank and so on. The homeroom teachers of these students could go over what is expected of the students, company policy and a union leader could be chosen and the like. When the students arrive they would punch the time clock and begin work. The instructor would act as the boss, so to speak, and keep track of their performance on special sheets designed for this purpose. The students

could be paid with a check or simulated money after every second class (in our situation there is one class held per week). This money could be deposited in their accounts at the school through the homeroom teachers, and these teachers could reinforce the money and banking aspect of the course. Also the TMH curriculum has a section on money management, so the two courses could work to reinforce each other.

A class could, with the cooperation of the homeroom teacher and the industrial education teacher, plan to have a strike take place and the union leader could get involved, negotiations could take place and the situation could develop into a good learning experience.

1. Given the company policies on the rate of pay (per hour, per unit, etc.), pay days, and procedure for obtaining his/her paycheck, the student will correctly identify the rate of pay, pay days, and the procedure for obtaining the paycheck.

   The information given by the student must each be within three minutes, and according to company policy on four consecutive occasions.

2. Given a description of unions and union functions, the student will describe a union and at least two functions it

performs on the worker's behalf.

Behaviour must be within three minutes on four consecutive occasions and the questions must be answered to the criteria set out by the teacher in the discussion of unions.

3. Given a visiting union representative, the students will talk to and/or listen to and ask questions after a presentation about unions and their function.

4. Given only verbal instructions, the student will explain at least two reasons workers go on strike.

The reasons must be stated adequately within three minutes on four consecutive occasions.

5. Given instruction on insurance, the student will explain at least one reason workers need insurance.

The reasons must be stated adequately within three minutes on four conseutive occasions.

g. Time Clock

These skills are ones that are directly concerned with

the correct operation on the time clock. Such skills include filling out the student card correctly, inserting the card into the time clock properly, and returning the card to the correct storage facility.

1. Given a time clock identification card, the student will fill out this card correctly including; name, address, postal code, phone number, and homeroom within fifteen minutes.

2. Given a time card and verbal instructions, upon arrival to class the student will insert the card into the time clock and punch the time and date on this card within30 seconds on each consecutive work day.

3. Given only verbal instructions the student will, after punching time card, return it to the appropriate storage facility within 30 seconds on each consecutive work day.

4. Given only verbal instructions, upon dismissal from class the student will insert the time card into the time clock and punch the time and date on this card within 30 seconds on each consecutive work day.

h. Money Management

These skills deal with the handling and distribution

of money and include skills similar to the following: obtaining pay, handling pay, using checks, budgeting, banking, deposits, withdrawals, expense records, and income tax.

The information obtained from the time clock will be used in calculating the pay required for each student.

1. Given only verbal instructions, the student will receive an envelope on the scheduled pay day upon appropriately checking out at the time clock, and this envelope shall be taken to the homeroom with the student.

   The behaviour will be completed within three minutes on each consecutive work day.

2. Given only verbal instruction, and upon examining his/her time sheet, the student will determine if the value of the paycheck is correct within five minutes on each consecutive payday.

3. Given only verbal instructions, the student will identify the person with whom he/she would talk to if there is a problem with the paycheck.

   The behaviour shall be met within fifteen seconds on five consecutive occasions and the person in charge must be

correctly identified.

4. Given appropriate instructions, the student will open a class bank account in his name with the teacher within thirty minutes on the first scheduled payday.

5. Given a bank deposit slip, a withdrawal slip, and check, presented in a mixed-up order, the student will identify each item when asked.

   The questions may be asked in any order and each responses must be made within fifteen seconds and the student response must be correct.

6. Given their paycheck, a deposit slip, and the school bank account in the student's name, the student will deposit the check into this account within five minutes on each consecutive payday.

7. Given a withdrawal slip, and the school bank account in the student's name, the student will withdraw a sum of money from his/her account within five minutes on five consecutive days.

8. Given a school item to purchase from the student bookstore, the student will purchase this item using a check from his/her checking account, also showing the necessary

personal identification for check cashing.

The behaviour will be within fifteen minutes on at least two separate occasions within the school year.

Prior arrangements may have to be made with the bookstore for this procedure to be initiated.

9. Given provincial and federal guidelines for income taxation, the student will keep track of all employment expenses and pay information for tax purposes.

This activity should be done as an ongoing process provided there is good cooperation from homeroom teachers.

10. Given simulated tax forms the student will, with help from the homeroom teacher, fill out these forms and mail them to the industrial education instructor. The forms will be evaluated and returned to the student.

This behaviour should be completed on the second last workday of the shool year so these forms could be returned by the last school workday.

This activity could be carried steps further by giving a refund to be deposited in the school account or by requiring a further payment of income tax, thereby

requiring another check be written. The follow-up activities could be discussed as to why some students received a refund while others had to pay more or still others paid the correct amount of tax. Students could also discuss why some paychecks were higher than others (missed days, etc.).

II. Safety

Safety plays a very important part of all our work lives. There must be an active safety program for the TMH students who are working in the industrial education lab.

a. What is Safety

1. Given a definition and an explanation of safety, the student will demonstrate an understanding of the concept of safety by discussing with the instructor the appropriate keywords and/or phrases.

Some of the keywords are; following correct operating procedures, protection of self and others, concern for security of others person or property, and so on.

b. Safety is an Ongoing Process

Students must be taught that safety is a continual process and not just part of their work while in the industrial education lab. Safety should be a part of their home life as well. What must be taught with regards to safety is an attitude, awareness, and concern of safety so these students will carry these ideas into their personal lives.

1. Given proper instructions on completing a particular task, the student will always be instructed with his/her safety in mind as the top priority and any deviation from these safe procedures will be positively corrected with the student.

c. Power Tools

Power tools can be very dangerous to the unsafe worker. The student will be instructed on the safe use of power tools as these tools are needed. Also the student will be continually reminded of the safety regulations with regards to each machine. The rules discussed below will be those that are applicable to all power tools with the specific power tool safety rules discussed later.

1. Given a discussion about wearing eye protection while using

all power tools, the student will wear eye protection while using any power tool.

The behaviour must occur each and every time or re-instruction must occur immediately.

2. Given a discussion about asking permission to use power tools and equipment, the student will ask permission to use power tools and equipment.

The behaviour must occur each and every time or re-instruction must occur immediately.

3. Given a discussion on guards and safety devices, the student will use all guards and safety devices.

The behaviour must occur each and every time or re-instruction must occur immediately.

4. Given a discussion on wearing safe attire to his/her work station, the student will wear safe attire to their work station.

The behaviour must occur each and every time. The behaviour must be consistent with the teacher-student discussion or re-instruction must occur immediately.

5. Given a disscusion on making adjustments to power tools and equipment, the student will remove the plug from the power source before making any adjustments to the power tools and equipment.

   The behaviour must occur each and every time or re-instruction must occur immediately.

6. Given a discussion on machine safety zones, the student will not enter the machine safety zone while he/she is observing another user use the power tool or power machine.

   The behaviour must occur each and every time or re-instruction must occur immediately.

d. Hand Tools

Hand tools can be very dangerous to the unsafe worker. The student will be instructed on the safe use of hand tools as these tools are needed. Also the student will be continually reminded of the safety regulations with regards to each. The rules discussed below will be those that are applicable to all hand tools with the specific hand tool safety rules discussed later.

1. Given instructions on specific hand tools, the student will use those tools only for the specific purpose it was

designed.

The behaviour must occur each and every time or re-instruction must occur immediately.

2. Given a discussion on safety, the student will not distract the attention of another student using a hand tool.

The behaviour must occur each and every time or re-instruction must occur immediately.

3. Given a discussion on safety, the student will wear appropriate clothing while working with hand tools.

This clothing must be in accordance with the instructor's guidelines given in the discussion.

4. Given a discussion on the safety of sharp tools and how to recognize dull tools, the student will report to the instructor when tools are not sharp.

The behaviour must occur each and every time or re-instruction must occur immediately.

e. Walking to get Tools or Supplies

1. Given a discussion on the safety of acquiring or returning

tools, the student will only walk.

The behaviour must occur each and every time or re-instruction must occur immediately.

f. Clean-up Safety

1. Given a discussion on the danger of slipping, the student will wipe up spilled liquids immediately.

The behaviour must occur each and every time or re-instruction must occur immediately.

2. Given a lesson on clean-up, the student will always use a brush to clean off the table.

The behaviour must occur each and every time or re-instruction must occur immediately.

3. Given a lesson on the correct use of a floor broom, the student will not interfere with another student.

The behaviour must occur each and every time or re-instruction must occur immediately.

g. Safety Entering and Exiting the Class

1. Given instructions to safely enter a classroom, the students will walk, single file into the classroom.

The behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions to safely exiting a classroom, the students will walk, single file from the classroom.

The behaviour must occur each and every time or re-instruction must occur immediately.

f. Safety at the Time Clock

1. Given instructions for safely approaching and using the time clock, the students will form single file behind the time clock, and punch in before the work period starts and punch out after the work period is completed.

The behaviour must occur each and every time or re-instruction must occur immediately.

III. Power Tools

a. Safety

Power tools are very advantageous in the working environment, but very dangerous if used incorrectly or unsafely. Each student is given comprehensive instruction on the use of each machine he or she will be using. In the future uses the operating instructions will be reviewed and eventually the student will operate the power tool by themselves. The length of instruction time needed before the student will operate a specific machine on their own will depend on the severity of the handicap and the maturity of the individual. Based on experience, some students have not yet been able to operate machines by themselves.

b. Operations

The operations expected of the students are of the simple nature. These operations are situations that deal with straight lines or very shallow curves. Using power tools to make difficult or complex curves is beyond the physical ability of the TMH student.

c. Processes

The process used to do any operations on power tools must be kept simple, straight forward, and be presented in small easily obtainable and logical steps. If the process is delivered too quickly or the steps do not follow a logical progression, the students will develop a fear of all power tools and this fear may never be conquered.

d. Supervision

Supervision of the students work on power tools must be of the highest priority as these students have little, if any, confidence in any type of work they do. During the first several times a student uses the power tools, the instructor should have his/her hands on top of the students' as this will insure the students' hands are in the correct place and the operation of the machine is done with the safest possible method. The instructor should never leave the student alone at the machine. The instructor may wish to remove his/her hands for a moment, but this should only be done after the student has gained a great amount of experience using a particular power tool.

e. Power Tools For Use

The power tools used by the TMH students will be

discussed separately below.

i. Band Saw

1. Given instructions the student will ask permission to use the bandsaw.

   Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will remove all jewelry, tuck in shirts, roll up sleeves, remove loose or baggy clothing before using the bandsaw.

   Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will adjust the blade guard so that it is three to six millimeters above the material to be cut.

   Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will wear approved eye protection while using the bandsaw.

Behaviour must occur each and every time or re-instruction must occur immediately.

5. Given instructions the student will plug in the machine before using the bandsaw.

Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will stand directly in front of the bandsaw so that the blade is in line with the center of their body.

Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will turn the power on to the bandsaw and wait until the blade has reached full speed.

Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will always keep his/her hands at least 50 millimeters away from the blade.

Behaviour must occur each and every time or re-instruction must occur immediately.

9. Given instructions the student will feed the material into the blade of the bandsaw only as fast as the teeth will easily cut the material.

Behaviour must occur each and every time or re-instruction must occur immediately.

10. Given instructions the student will turn off the power and wait until the blade has stopped moving before backing out of long straight cuts or long curved cuts.

Behaviour must occur each and every time or re-instruction must occur immediately.

11. Given instructions the student will, when finished, turn off the power to the machine and wait for the blade to stop turning.

Behaviour must occur each and every time or re-instruction must occur immediately.

12. Given instructions the student will unplug the machine and wrap the cord around the machine so it is safely out of the way.

Behaviour must occur each and every time or re-instruction must occur immediately.

13. Given instructions the student will lower the safety guard onto the bandsaw table. (This forces the next student to correctly set the guard.)

Behaviour must occur each and every time or re-instruction must occur immediately.

ii. Disk Sander

1. Given instructions the student will ask permission to use the disk sander.

Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will check and make sure that the disk is secure and in place.

Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will make all adjustments with the power turned off.

Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will ask for a new disk to be installed if it appears to be worn out.

5. Given instructions the student will always keep hands away from the abrasive surface.

Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will only use the flat surface of the disk and never the edge of the abrasive disk.

Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will hold material firmly against the stop fence or mitre gauge.

Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will feed the material against the correct side of the disk surface. (This is

referred to as the 'down side')

Behaviour must occur each and every time or re-instruction must occur immediately.

9. Given instructions the student will turn the power on and wait until the disk has reached full speed.

Behaviour must occur each and every time or re-instruction must occur immediately.

10. Given instructions the student will keep the material moving against the abrasive surface.

Behaviour must occur each and every time or re-instruction must occur immediately.

11. Given instructions the student will apply light pressure when feeding the material against the abrasive surface.

Behaviour must occur each and every time or re-instruction must occur immediately.

iii. Orbital Sander

1. Given instructions the student will ask

permission to use the orbital sander.

Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will check and make sure that the abrasive surface is secure and in place.

Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will make all adjustments with the power turned off.

Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will ask for a new abrasive pad to be installed if it appears to be worn out.

5. Given instructions the student will always keep hands away from the abrasive surface.

Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will only use the flat surface of the abrasive pad and never the edge of the abrasive pad.

   Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will turn the power on and wait until the abrasive pad has reached full speed.

   Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will keep the abrasive pad moving against the stationary material to be sanded.

   Behaviour must occur each and every time or re-instruction must occur immediately.

9. Given instructions the student will apply light pressure contact between the abrasive pad and the material being sanded.

   Behaviour must occur each and every time or

re-instruction must occur immediately.

iv. Belt Sander

1. Given instructions the student will ask permission to use the belt sander.

   Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will check and make sure that the belt is secure and in place.

   Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will make all adjustments with the power turned off.

   Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will ask for a new belt to be installed if it appears to be worn out.

5. Given instructions the student will always keep hands away from the abrasive surface.

   Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will only use the flat surface of the belt and never the edge of the abrasive belt.

   Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will hold material firmly against the stop fence or mitre gauge.

   Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will feed the material against the correct side of the belt surface. (This is referred to as the °down side'.)

   Behaviour must occur each and every time or re-instruction must occur immediately.

9. Given instructions the student will turn the power on and wait until the belt has reached full speed.

Behaviour must occur each and every time or re-instruction must occur immediately.

10. Given instructions the student will keep the material moving against the abrasive surface.

Behaviour must occur each and every time or re-instruction must occur immediately.

11. Given instructions the student will apply light pressure when feeding the material against the abrasive surface.

Behaviour must occur each and every time or re-instruction must occur immediately.

v. Drill Press

1. Given instructions the student will ask permission to use the drill press.

Behaviour must occur each and every time or

re-instruction must occur immediately.

2. Given instructions the student will be appropriately clothed for using the drill press.

   The clothing must be consistent with the lesson given by the instructor.

3. Given instructions then student will use the correct type and size of drill bit for the job.

   Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will mount the drill bit in the center of the chuck and to the full depth of the shank of the drill bit.

   Behaviour must occur each and every time or re-instruction must occur immediately.

5. Given instructions the student will, after tightening the drill bit in the chuck, remove the chuck key.

Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will position the table and adjust the feed stroke so the drill will not strike the table of the drill press.

Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will plug in the electric power cord.

Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will wear eye protection.

Behaviour must occur each and every time or re-instruction must occur immediately.

9. Given instructions the student will turn on the machine.

Behaviour must occur each and every time or

re-instruction must occur immediately.

10. Given instructions the student will feed the drill bit smoothly into the material.

    Behaviour must occur each and every time or re-instruction must occur immediately.

11. Given instructions the student will, when finished, turn off the drill press, wait for it to stop, and unplug the electrical cord.

    Behaviour must occur each and every time or re-instruction must occur immediately.

12. Given instructions the student will remove the drill bit from the chuck and return the drill bit to the instructor.

vi. Electric Hand Drill

1. Given instructions the student will ask permission to use the electric hand drill.

    Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will use the correct type and size of drill bit.

   Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will mount the drill bit in the center of the chuck and to the full depth of the shank of the drill bit.

   Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will, after tightening the drill bit in the chuck, remove the chuck key.

   Behaviour must occur each and every time or re-instruction must occur immediately.

5. Given instructions the student will plug in the electric power cord.

   Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will wear eye

protection.

Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will turn on the electric hand drill.

Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will feed the drill bit smoothly into the material.

Behaviour must occur each and every time or re-instruction must occur immediately.

9. Given instructions the student will, when finished, turn off the electric hand drill, wait for it to stop, and unplug the electrical cord.

Behaviour must occur each and every time or re-instruction must occur immediately.

10. Given instructions the student will remove the drill bit from the chuck and return the

drill bit to the instructor.

Behaviour must occur each and every time or re-instruction must occur immediately.

11. Given instructions the student will return the electric hand drill to its storage place.

Behaviour must occur each and every time or re-instruction must occur immediately.

vii. Buffer

1. Given instructions the student will ask permission to use the buffer.

Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will hold the material correctly.

Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will plug the electrical cord into the wall outlet.

Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will wear eye protection.

Behaviour must occur each and every time or re-instruction must occur immediately.

5. Given instructions the student will turn on the buffer.

Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will feed the material gently against the buffing wheel in a back and forth motion.

Behaviour must occur each and every time or re-instruction must occur immediately.

7. Given instructions the student will, when finished, turn off the buffer, wait until it has stopped turning, and unplug the buffer.

Behaviour must occur each and every time or re-instruction must occur immediately.

viii. Vacuum Former

1. Given instructions the student will ask permission to use the vacuum former.

   Behaviour must occur each and every time or re-instruction must occur immediately.

2. Given instructions the student will correctly insert the mold into the vacuum former.

   Behaviour must occur each and every time or re-instruction must occur immediately.

3. Given instructions the student will correctly and securely insert the material to be formed into the vacuum former.

   Behaviour must occur each and every time or re-instruction must occur immediately.

4. Given instructions the student will insert the plug into the wall outlet and turn on the vacuum former.

Behaviour must occur each and every time or re-instruction must occur immediately.

5. Given instructions the student will wear heat resistant gloves.

Behaviour must occur each and every time or re-instruction must occur immediately.

6. Given instructions the student will form the material around the mold.

7. Given instructions the student will turn off the vacuum former and unplug the machine.

Behaviour must occur each and every time or re-instruction must occur immediately.

8. Given instructions the student will return the heat resistant gloves to the correct storage place.

Behaviour must occur each and every time or re-instruction must occur immediately.

ix. Injection Molder

1. Given instructions the student will ask permission to use the injection molder.

   Behaviour must occur each and every time or re-instruction must occur.

2. Given instructions the student will plug in and turn on the injection molder.

   Behaviour must occur each and every time or re-instruction must occur.

3. Given instructions the student will assemble the mold to be used for injection molding.

   Behaviour must occur each and every time or re-instruction must occur.

4. Given instructions the student will fill the injection molder hopper with material to be injected.

   Behaviour must occur each and every time or re-instruction must occur.

5. Given instructions the student will insert the mold correctly into the injection molder.

   Behaviour must occur each and every time or re-instruction must occur.

6. Given instructions the student will inject the material into the mold.

   Behaviour must occur each and every time or re-instruction must occur.

7. Given instructions the student will remove the mold from the injection molder.

   Behaviour must occur each and every time or re-instruction must occur.

8. Given instructions the student will remove the molded item from the mold.

   Behaviour must occur each and every time or re-instruction must occur.

9. Given instructions the student will unplug the injection molder electric cord from the

wall outlet.

Behaviour must occur each and every time or re-instruction must occur.

10. Given instructions the student will return the mold and gloves to the proper storage place.

Behaviour must occur each and every time or re-instruction must occur.

x. Electric Soldering Iron

1. Given instructions the student will ask permission to use the electric soldering iron.

Behaviour must occur each and every time or re-instruction must occur.

2. Given instructions the student will plug the electrical cord into the wall outlet.

Behaviour must occur each and every time or re-instruction must occur.

3. Given instructions the student will secure the item to be soldered in a vise.

   Behaviour must occur each and every time or re-instruction must occur.

4. Given instructions the student will solder the item.

   Behaviour must occur each and every time or re-instruction must occur.

5. Given instructions the student will unplug the electric soldering iron and allow it to cool.

   Behaviour must occur each and every time or re-instruction must occur.

6. Given instructions the student will return the electric soldering iron to the correct storage place.

   Behaviour must occur each and every time or re-instruction must occur.

IV. Hand Tools

a. Safety

Hand tools are very useful to the student working in the industrial education lab. If used incorrectly or unsafely, these tools could become very dangerous. Each student is given comprehensive instruction in the use of each hand tool he or she will be using. As the students gain more experience with a specific tool he/she will become more confident in its use and may be left unsupervised for long periods of time.

b. Operations

The operations expected of the students are of the simple nature. The cuts or shapes a student would make are based on straight lines or very simple curves.

c. Processes

The processes used to do any operations with any hand tools must be kept simple, straight forword, and be presented in small easily obtainable and logical steps. If the process is

delivered too quickly or the steps do not follow a logical progression the students may grow to fear these hand tools.

d. Supervision

Supervision of students using hand tools is very important especially at the beginning when these students do not have their confidence built up yet. As the students gain more experience it would be quite acceptable to leave some students, depending on their maturity and ability, unsupervised for long periods of time.

e. Hand Tools For Use

i. Hammer

1. Given instructions the student will identify a ball peen hammer on three out of four occasions within three minutes.

2. Given instructions the student will identify a claw hammer on three out of four occasions within three minutes.

3. Given instructions the student will correctly

hold a ball peen hammer five out of five times within three minutes.

Behaviour must occur each and every time or re-instruction must occur.

4. Given instructions the student will correctly hold a claw hammer five out of five times within three minutes.

Behaviour must occur each and every time or re-instruction must occur.

5. Given instructions the student will correctly hammer a nail with a claw hammer two out of three times within three minutes.

ii. Screwdriver

1. Given instructions the student will identify a conventional screwdriver two out of three times within three minutes.

2. Given instructions the student will identify a Robertson screwdriver two out of three times within three minutes.

3. Given instructions the student will identify a Phillips screwdriver two out of three times within three minutes.

4. Given instructions and a wood screw, the student will choose the correct type of screwdriver two out of three times within three minutes.

5. Given instructions and a Robertson wood screw, the student will choose the correct size of screwdriver three out of four times within three minutes.

iii. Files

1. Given instructions and an assortment of files, the student will identify a ten-inch flat mill file two out of three times within three minutes.

2. Given instructions and an assortment of files, the student will identify a ten-inch flat mill bastard file two out of three times within three minutes.

3. Given instructions and an assortment of

files, the student will identify a ten-inch half round cabinet file two out of three times within three minutes.

4. Given instructions and an assortment of files, the student will identify an eight-inch triangular file two out of three times within three minutes.

5. Given instructions and an assortment of files, the student will identify an eight-inch round file two out of three times within three minutes.

6. Given instructions and an assortment of files, the student will identify a surform file two out of three times within three minutes.

7. Given instructions the student will hold a file correctly on two out of three ocassions within three minutes.

8. Given instructions the student will cut correctly with at least three different files on four out of five ocassions within five minutes.

iv. Wood Rasp

1. Given instructions the student will identify a wood rasp two out of three times within three minutes.

2. Given instructions the student will hold a wood rasp correctly two out of three times within three minutes.

3. Given instructions the student will cut correctly with a wood rasp on four out of five ocassions within five minutes.

v. Back Saw

1. Given instructions the student will identify a back saw three out of four times within five minutes.

2. Given instructions the student will hold the back saw correctly to perform a cutting operation on a sample of wood four out of five times within four minutes.

3. Given instructions the student will stand

correctly to perform a cutting operation on a sample of wood four out of five times within four minutes.

vi. Wood Chisel

1. Given instructions the student will identify a wood chisel three out of four times within three minutes.

2. Given instructions and eight different sized wood chisels, the student will arrange them in order of increasing size with the smallest on the left side and the largest on the right side on two out of three ocassions within ten minutes.

3. Given instructions and a slot of specific size cut from a piece of wood, the student will place the wood chisel blade that most closely fits in the slot three out of four times within three minutes.

4. Given instructions and a board with two saw cuts in it, the student will correctly remove the material to form a dado three out of four times within five minutes.

vii. Clamps

1. Given instructions and an assortment of clamps, the student will identify a handscrew clamp three out of four times within three minutes.

2. Given instructions and an assortment of clamps, the student will identify a pipe clamp three out of four times within three minutes.

3. Given instructions and an assortment of clamps, the student will identify a c-clamp three out of four times within three minutes.

4. Given instructions and an assortment of clamps and two small samples of wood, the student will clamp the two samples together using a handscrew clamp three out of four times within three minutes.

5. Given instructions and an assortment of clamps and two small samples of wood, the student will clamp the two samples together using a c-clamp three out of four times

within three minutes.

6. Given instructions and an assortment of clamps and two small samples of wood, the student will clamp the two samples together using a pipe clamp three out of four times within three minutes.

viii. Rulers

1. Given instructions and an assortment of rulers, the student will identify a ruler with centimeter markings on it three out of four times within two minutes.

2. Given instructions and an assortment of rulers, the student will identify a ruler with millimeter markings on it three out of four times within two minutes.

3. Given instructions and five pieces of material of varying length, the student will measure each piece using a millimeter ruler to the nearest millimeter with 80 percent accuracy three out of four times within twenty minutes.

4. Given instructions and five pieces of material of varying length, the student will measure each piece using a centimeter ruler to the nearest centimeter with 80 percent accuracy three out of four times within twenty minutes.

ix. Squares

1. Given instructions and an assortment of squares, the student will identify a tri-square three out of four times within three minutes.

2. Given instructions and an assortment of squares, the student will identify a carpenter's square three out of four times within three minutes.

3. Given instructions and an assortment of squares, the student will identify a combination square three out of four times within three minutes.

4. Given instructions, a sample of wood, a pencil and a carpenter's square the student will use the carpenters square and pencil to

draw five square lines across the wood sample with 80 percent accuracy three out of four times within ten minutes.

5. Given instructions, a sample of wood, a pencil and a tri-square, the student will use the tri-square and pencil to draw five square lines across the wood sample with 80 percent accuracy three out of four times within ten minutes.

6. Given instructions, a sample of wood, a pencil and a combination square, the student will use the combination square and pencil to draw five forty - five degree lines across the wood sample with 80 percent accuracy three out of four times within ten minutes.

x. Hand Planes

1. Given instructions and several hand planes, the student will identify a block plane three out of four times within three minutes.

2. Given instructions and several hand planes, the student will identify a jack plane three out of four times within three minutes.

3. Given instructions and several hand planes, the student will identify a smoothing plane three out of four times within three minutes.

4. Given instructions, a smoothing plane and a pre-measured board, the student will plane a specified amount of material from that board with 100 percent accuracy within ten minutes.

5. Given instructions the student will correctly rest the plane on the table when completed the planing operation four out of five times within 30 minutes.

xi. Vise

1. Given instructions and an assortment of tools, the student will identify a vise three out of four times within three minutes.

2. Given instructions and a sample piece of wood, the student will securely mount the piece of wood in the vise three out of four times within three minutes.

3. Given instructions and a sample piece of wood

mounted securely in a vise, the student will remove the piece of wood from the vise three out of four times within three minutes.

xii. Wrench

1. Given instructions and an assortment of different sizes and styles of wrenches, the student will identify a crescent wrench three out of four times within three minutes.

2. Given instructions and an assortment of different sizes and styles of wrenches, the student will identify a box open end wrench three out of four times within three minutes.

3. Given instructions and an assortment of different sizes and styles of wrenches, the student will identify a double open end wrench three out of four times within three minutes.

4. Given instructions and an assortment of wrenches and a bolt with a hex head on it between 10 millimeters and 17 millimeters, the student will find the wrench that fits that bolt head three out of four times within

three minutes.

5. Given instructions and an assortment of wrenches and a bolt with a hex head on it between 10 millimeters and 17 millimeters, the student will adjust a crescent wrench to fit that bolt head three out of four times within three minutes.

6. Given instructions, a piece of wood with a bolt passing through it, a nut with a head size between 10 millimeters and 17 millimeters and an assortment of wrenches, the student will thread the nut onto the bolt and tighten it up with the correct size of box open end wrench three out of four times within five minutes.

7. Given instructions, a piece of wood with a bolt passing through it, a nut with a head size between 10 millimeters and 17 millimeters and an assortment of wrenches, the student will thread the nut onto the bolt and tighten it up with a crescent wrench adjusted to the correct size three out of four times within five minutes.

xiii. Utility Knife

1. Given instructions and an assortment of small hand tools, the student will identify a utility knife four out of five times within three minutes.

2. Given instructions, a utility knive, a ruler and paper, the student will use the ruler as a straight edge and make five straight line cuts at least half the length of the paper in the piece of paper three out of four times within five minutes.

xiv. Tin Snips

1. Given instructions and an assortment of hand tools, the student will identify a pair of straight cut tin snips four out of five times within five minutes.

2. Given instructions, a pair of straight cut tin snips, and a piece of 22 to 24 guage tin with at least five lines a minimum of 100 millimeters long drawn on the tin, the student will cut these five lines at least 100 millimeters long with 80 percent accuracy

four out of five times within ten minutes.

xv. Staple Gun

1. Given instructions and an assortment of hand tools, the student will identify a staple gun four out of five times within five minutes.

2. Given instructions, a staple gun loaded with staples and a sample of plywood, the student will place a minimum of ten staples into the piece of plywood with 100 percent accuracy within five minutes.

xvi. Pliers

1. Given instructions and an assortment of pliers, the student will identify a pair of needlenose pliers four out of five times within three minutes.

2. Given instructions and an assortment of pliers, the student will identify a pair of sidecutter pliers four out of five times within three minutes.

3. Given instructions and an assortment of

pliers, the student will identify a pair of slipjoint pliers four out of five times within three minutes.

4. Given instructions and an assortment of pliers, the student will identify a pair of conventional pliers four out of five times within three minutes.

5. Given instructions and an assortment of pliers, the student will identify a pair of vise-grip pliers four out of five times within three minutes.

6. Given instructions and a piece of 14 guage copper wire at least 150 millimeters long, the student will, using sidecutter pliers, cut at least five pieces of copper wire from the long piece four out of five times within ten minutes.

xvii. File Card

1. Given instructions and an assortment of hand tools, the student will identify a file card four out of five times within three minutes.

2. Given instructions, a file card and a dirty file, the student will clean the file with the file card with 80 percent accuracy three out of four times within ten minutes.

xviii. Brace And Bit

1. Given instructions and an assortment of hand tools, the student will identify a brace three out of four times within three minutes.

2. Given instructions and an assortment of hand tools, the student will identify a bit for the brace three out of four times within three minutes.

3. Given instructions and an assortment of hand tools, the student will identify an adjustable bit for the brace three out of four times within three minutes.

4. Given instructions, a brace and a bit for the brace, the student will mount the bit securely in the brace three out of four times within three minutes.

5. Given instructions, a brace with a bit

mounted securely in it, and a sample piece of wood, the student will drill three holes through the sample piece of wood with the brace and bit with 100 percent accuracy within ten minutes.

xix. Hack Saw

1. Given instructions and an assortment of hand tools, the student will identify a hacksaw four out of five times within three minutes.

2. Given instructions and a piece of three millimeter by twelve millimeter cold rolled mild steel, the student will mount this piece of metal in a vise and will cut correctly a piece at least 50 millimeters in length with 80 percent accuracy within five minutes.

xx. Scissors

1. Given instructions and an assortment of hand tools, the student will identify a pair of scissors three out of four times within three minutes.

2. Given instructions, a piece of paper with

five lines drawn on it that are at least 150 millimeters long and a pair of scissors, the student will cut along these five lines with 80 percent accuracy four out of five times within ten minutes.

xxi. Mallet

1. Given instructions and an assortment of hand tools, the student will identify a mallet three out of four times within three minutes.

xxii. Leather Stamps

1. Given instructions and an assortment of hand tools, the student will identify at least three leather stamping tools four out of five times within three minutes.

2. Given instructions and an assortment of leather stamping tools, a mallet and a sample of leather, the student will stamp at least five different stamping tools into the sample of leather with 80 percent accuracy within five minutes.

xxiii. Revolving Punch

1. Given instructions and an assortment of hand tools, the student will identify a revolving punch three out of four times within three minutes.

2. Given instructions, a revolving punch and a sample of leather, the student will punch at least ten holes in the leather sample with 100 percent accuracy within five minutes.

xxiv. Swivel Knife

1. Given instructions and an assortment of leather working tools, the student will identify a swivel knife four out of five times within three minutes.

2. Given instructions, a swivel knife and a sample of leather, the student will cut with the swivel knife at least five lines that are a minimum of 50 millimeters in length to a depth of half way through the leather with 80 percent accuracy four out of five times within ten minutes.

V. Hand Operated Equipment

a. Miter Box

1. Given instructions the student will identify a miter box three out of four times within three minutes.

2. Given instructions the student will securely mount a sample piece of wood in the miter box two times within five minutes.

3. Given instructions the student will correctly hold the miter saw within two minutes.

4. Given instructions the student will correctly make one cut on the sample piece of wood with 100 percent accuracy within three minutes.

b. Box And Pan Brake

1. Given instructions and a sample piece of 22 guage galvanized sheet metal with a line drawn the entire length of the piece, the student will insert the sample piece into the box and pan brake and clamp the jaws directly

on the line three times out of four within three minutes.

2. Given instructions the student will bend the sample piece of metal to 90 degrees three out of four times within ten minutes.

c. Di-Acro Circle Bender

1. Given instructions, a sample piece of three millimeter by twelve millimeter flat cold rolled mild steel, the student will correctly insert this piece into the Di-Acro Circle Bender three out of four times within five minutes.

2. Given instructions the student will bend this sample piece of metal into a complete circle three out of four times within five minutes.

d. Strip Heater

1. Given instructions the student will plug the electrical cord into the wall outlet within one minute.

2. Given instructions the student will turn on

the strip heater to warm up within one minute.

3. Given instructions and a sample of plastic with a line drawn on it to mark the bending location, the student will place this plastic over the opening in the strip heater so the bending line is in the correct place three out of four times within three minutes.

e. Frying Pan

1. Given instructions the student will plug the electrical cord into the wall outlet within one minute.

2. Given instructions the student will turn on the frying pan to the maximum temperature to warm up.

3. Given instructions and a sample of plastic for forming, the student will place the plastic in the center of the frying pan three out of four times within three minutes.

4. Given instructions the student will place the lid on the frying pan within one minute.

VI. Supplies and Materials

a. Wood

1. Given a sample of mahogany, a sample of alder and a sample of walnut, the student will identify a sample of walnut four out of five times within three minutes.

2. Given a sample of mahogany, a sample of alder and a sample of walnut, the student will identify a sample of alder four out of five times within three minutes.

3. Given a sample of mahogany, a sample of alder and a sample of walnut, the student will identify a sample of mahogany four out of five times within three minutes.

4. Given instructions and a picture of a coniferous tree and a picture of a deciduous tree, the student will identify a deciduous tree three out of four times within three minutes.

5. Given instructions and a picture of a

coniferous tree and a picture of a deciduous tree, the student will identify a coniferous tree three out of four times within three minutes.

b. Plastic

1. Given instructions, a sample of uvex, a sample of plexiglass, a sample of polystyrene and a sample of polyethylene, the student will identify the sample of polyethelene three out of four times within three minutes.

2. Given instructions, a sample of uvex, a sample of plexiglass, a sample of polystyrene and a sample of polyethylene, the student will identify the sample of polystyrene three out of four times within three minutes.

3. Given instructions, a sample of uvex, a sample of plexiglass, a sample of polystyrene and a sample of polyethylene, the student will identify the sample of plexiglass three out of four times within three minutes.

4. Given instructions, a sample of uvex, a sample of plexiglass, a sample of polystyrene

and a sample of polyethylene, the student will identify the sample of uvex three out of four times within three minutes.

c. Metal

1. Given instructions and a sample of aluminum, a sample of steel, a sample of brass and a sample of copper, the student will identify a sample of copper three out of four times within three minutes.

2. Given instructions and a sample of aluminum, a sample of steel, a sample of brass and a sample of copper, the student will identify a sample of steel three out of four times within three minutes.

3. Given instructions and a sample of aluminum, a sample of steel, a sample of brass and a sample of copper, the student will identify a sample of brass three out of four times within three minutes.

4. Given instructions and a sample of aluminum, a sample of steel, a sample of brass and a sample of copper, the student will identify a

sample of aluminum three out of four times within three minutes.

5. Given instructions and a sample of round metal, a sample of square metal, a sample of rectangular metal and a sample of pipe, the student will identify a sample of pipe three out of four times within three minutes.

6. Given instructions and a sample of round metal, a sample of square metal, a sample of rectangular metal and a sample of pipe, the student will identify a sample of rectangular metal three out of four times within three minutes.

7. Given instructions and a sample of round metal, a sample of square metal, a sample of rectangular metal and a sample of pipe, the student will identify a sample of square metal three out of four times within three minutes.

8. Given instructions and a sample of round metal, a sample of square metal, a sample of rectangular metal and a sample of pipe, the student will identify a sample of round metal

three out of four times within three minutes.

d. Leather

1. Given instructions, a sample of smooth leather and a sample of suede leather, the student will identify a piece of suede leather three out of four times within three minutes.

2. Given instructions, a sample of smooth leather and a sample of suede leather, the student will identify a piece of smooth leather three out of four times within three minutes.

e. Sandpaper

1. Given instructions, a sample of 50 grit sandpaper, a sample of 80 grit sandpaper, a sample of emery cloth and a sample of 120 grit sandpaper, the student will identify a sample of 120 grit sandpaper three out of four times within three minutes.

2. Given instructions, a sample of 50 grit sandpaper, a sample of 80 grit sandpaper, a

sample of emery cloth and a sample of 120 grit sandpaper, the student will identify a sample of 80 grit sandpaper three out of four times within three minutes.

3. Given instructions, a sample of 50 grit sandpaper, a sample of 80 grit sandpaper, a sample of emery cloth and a sample of 120 grit sandpaper, the student will identify a sample of 50 grit sandpaper three out of four times within three minutes.

4. Given instructions, a sample of 50 grit sandpaper, a sample of 80 grit sandpaper, a sample of emery cloth and a sample of 120 grit sandpaper, the student will identify a sample of emery cloth three out of four times within three minutes.

f. Woodscrews

1. Given instructions and a sample of a Robertson screw, a sample of a Phillips screw and a sample of a conventional screw, each two inches long, the student will identify the Robertson head screw four out of five times within three minutes.

2. Given instructions and a sample of a Robertson screw, a sample of a Phillips screw and a sample of a conventional screw, each two inches long, the student will identify the Phillips head screw four out of five times within three minutes.

3. Given instructions and a sample of a Robertson screw, a sample of a Phillips screw and a sample of a conventional screw, each two inches long, the student will identify the conventional head screw four out of five times within three minutes.

4. Given instructions and a sample of Robertson screws of varying lengths, a sample of Phillips screws of varying lengths and a sample of conventional screws of varying lengths, the student will sort the Robertson head screws into a pile four out of five times within five minutes.

5. Given instructions and a sample of Robertson screws of varying lengths, a sample of Phillips screws of varying lengths and a sample of conventional screws of varying

lengths, the student will sort the Phillips head screws into a pile four out of five times within five minutes.

6. Given instructions and a sample of Robertson screws of varying lengths, a sample of Phillips screws of varying lengths and a sample of conventional screws of varying lengths, the student will sort the conventional head screws into a pile four out of five times within five minutes.

g. Nails

1. Given instructions, a sample of finishing nails and a sample of box nails, the student will identify a finishing nail four out of five times within five minutes.

2. Given instructions, a sample of finishing nails and a sample of box nails, the student will identify a box nail four out of five times within five minutes.

h. Glue

1. Given instructions, a sample of white glue

and a sample of rubber cement, the student will identify the glue that is used for gluing wood four out of five times within three minutes.

2. Given instructions, a sample of white glue and a sample of rubber cement, the student will identify the glue that is used for gluing paper four out of five times within three minutes.

i. Finishing Materials

1. Given instructions, a sample of vegetable oil, a sample of paint, a sample of varnish and a sample of leather dye, the student will identify the leather dye finishing material three out of four times within three minutes.

2. Given instructions, a sample of vegetable oil, a sample of paint, a sample of varnish and a sample of leather dye, the student will identify the vegetable oil finishing material three out of four times within three minutes.

3. Given instructions, a sample of vegetable oil, a sample of paint, a sample of varnish

and a sample of leather dye, the student will identify the varnish finishing material three out of four times within three minutes.

4. Given instructions, a sample of vegetable oil, a sample of paint, a sample of varnish and a sample of leather dye, the student will identify the paint finishing material three out of four times within three minutes.

VII. Other Equipment

a. Time Clock

1. Given instructions and a time clock, the student will line up single file behind the time clock at the beginning of the work day.

Behaviour must occur each and every time or re-instruction must occur.

2. Given instructions the student will remove his or her time card from the rack.

Behaviour must occur each and every time or re-instruction must occur.

3. Given instructions the student will insert his or her time card into the time clock to °punch in' at the beginning of the work day.

   Behaviour must occur each and every time or re-instruction must occur.

4. Given instructions and a time clock, the student will line up single file behind the time clock at the end of the work day.

   Behaviour must occur each and every time or re-instruction must occur.

5. Given instructions the student will remove his or her time card from the rack.

   Behaviour must occur each and every time or re-instruction must occur.

6. Given instructions the student will insert his or her time card into the time clock to °punch out' at the end of the work day.

   Behaviour must occur each and every time or re-instruction must occur.

VIII. Computation

a. Addition

The instructor shall determine assignments that will help the student to reinforce the academic disciplines, in this case, the area of addition in mathematics. The instructor must make every effort to cooperate and coordinate what is happening with these students in their homeroom classes.

b. Subtraction

The instructor shall determine assignments that will help the student to reinforce the academic disciplines, in this case, the area of subtraction in mathematics. The instructor must make every effort to cooperate and coordinate what is happening with these students in their homeroom classes.

c. Multiplication

The instructor shall determine assignments that will help the student to reinforce the academic disciplines, in this case, the area of multiplication in mathematics. The instructor must make every effort to cooperate and coordinate what is happening with these students in their homeroom classes.

d. Division

The instructor shall determine assignments that will help the student to reinforce the academic disciplines, in this case, the area of division in mathematics. The instructor must make every effort to cooperate and coordinate what is happening with these students in their homeroom classes.

IX. Following Directions

a. Authority Figures

The student will recognise the

instructor and any other adult supervisor as an authority figure. It is the responsiblity of the instructor to obtain all the necessary information from all available sources to make sure the instructor and other adults shall remain the authority figures.

b. Supervision

While the student is under the control of the teacher's instruction, it is the teacher's responsibility to make sure that proper procedures are going to be followed, objectives will be met and so forth.

Summary

The curriculum guide presented above is only that, a guide. This guide can be changed according to the needs of the students, needs of the parents, and the needs of the community. The areas covered may be to specific for the students or too complex, and therefore, may need to be adjusted. The material presented in this chapter is based on one-50 minute class every six school days, and a class size of 12 students with one industrial education teacher, two homeroom teachers, and three teachers' aides.

A sample of suggested activities taken from a book

which is no longer in print, is contained in Appendix 2. The book is titled Occupational Activities Training Manual For Severely Retarded Adults by Jay L. Zaetz. (Charles C. Thomas Publisher, Springfield Illinois, 1969). The book is out of print but photocopy versions are available from the publisher at the following address:

Bannerstone House,
301-327 East Lawrence Avenue,
Springfield, Illinois

or

Natchez Plantation House,
735 North Atlantic Boulevard,
Fort Lauderdale, Florida

Appendix 3 contains a list and diagrams of projects that have been tested and can be used with TMH students. All projects were developed by the author.

Appendix 4 contains a suggested equipment list, above and beyond, or self contained, to be purchased for use with a TMH class in industrial education. It is recommended that the class have their own hand tools to enable them to make the most of their small number of periods.

A list of provincial and state agencies or institutions is provided in Appendix 5. When the author contacted these agencies some had moved and some had not responded and some had closed down, but the majority provided some information. The addresses following these institutions are as complete as possible.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Summary And Conclusions

Chapter 1 outlined the problem that industrial education teachers are not prepared for the education of the slow learner, so therefore, are reluctant to become involved in this educational process.

Six points are brought forth that summarize the problem.

First, TMH student needs must be identified in the area of industrial education.

Second, TMH students have not been provided with positive educational experiences in industrial education and a poor grade says more about the quality of instruction than the ability of the child.

Third, basic attitudinal changes must occur at the instructional level in industrial education if these students are to receive meaningful industrial education experiences.

Fourth, industrial education cannot afford to neglect any component of special education as industrial education is one of the few areas in

school that allows manipulation of so many variables to provide just the right educational experience for these TMH students.

Fifth, industrial education can provide learning experiences for the TMH student in the areas pertaining to total sensory involvement.

Sixth, recognise that the TMH student needs more time, energy and resources made available for their education.

Industrial education has a vital part to play in the education of these individuals, and there is presently no curriculum available. So industrial education teachers must not wait for someone else to do the job. It must be done and done now, while it is necessary.

The purpose of the study was to develop several useful documents that can be used directly by the industrial education teacher. Since schools have a responsibility to educate children, the curriculum documents must be developed at the school level.

Chapter 2 presented a brief introduction to the procedures for review of any current literature that may be available on the education of TMH students whether it be in industrial education or any parallel study. The majority of the chapter deals with personal characteristics of

TMH students and methods of curriculum development to be aware of when developing curriculum for TMH students as well as slow learners.

Trainable mentally handicapped students lack system control with the most affected area being attention span. Limited emotional control is another problem facing TMH students as well as the inability to inhibit a response to a stimulus. Motor control also suffers with these students resulting in restlessness. Frustration sets in quickly, and discipline can be difficult because of the reduced response to pain or pleasure. Therefore, physical punishment or deprivation of priviledges has no lasting effect.

Some theories of education of slow learners are put forth by Meyen, Mossman, Sapir and Wilson, Rosenshine and Furst, and Neff and Pilch. The conclusion is that no one method will work for all TMH students, and no one method will be successful for a given teacher.

The chapter goes on to identify several teaching strategies for slow learners which are put forth by Englemann, Brown, Bellamy, and Sontag, Learner, Montessori, Banta, Gearheart, Litton, Piaget, and Inhelder. Florida State Department of Education and Menomonie Public Schools in Wisconsin provided two other approaches

to teaching the TMH and slow learner.

The final result is that there is little material available on teaching the TMH student, and none in industrial education, but there is some evidence that the material available could be adapted to teaching these special education students.

Chapter 3 indicates a growing body of research supports the approach of teaching slow learners with Task Analysis. Task analysis is the breaking down of large jobs into smaller component responses. Several definitions of task analysis is put forth in Chapter 3 from Mager and Davies, Brown and Bellamy and Sontag, Edgar and Horing, and Wehman. Bellamy outlines six steps that are necessary when developing a task analysis.

First, the person doing the training must construct the task analysis.

Second, the task should be repeated by the trainer several times to become exactly familiar with it.

Third, break the task down into functional response units in the order they will be done.

Fourth, for each step in the chain, list the stimulus and response.

Fifth, review the steps to be sure similiar stimulus do not cue the same response.

Sixth, use the steps in the task analysis to construct a training data sheet.

The teacher must become completely familiar with the task analysis in all aspects to be able to deliver the best possible instruction to a child. Bellamy goes on to say that task analysis is more than teaching a student how to perform a task but when it is appropriate to emit each behaviour.

Saunders and Koplik developed a task analysis data sheet by listing the stimulus and response that make up the task analysis steps. There is an example provided in the thesis to provide greater clarity for the user. This method provides four advantages. First, this method allows the user to collect and graph raw data on the same page. Second, since data does not need to be collected on each training period, the user can focus attention to the learner. Third, the ease of use may allow more users to use such a data collection sheet, and fourth, the sheet allows easy visual interpretation of the data.

Chapter 4 is the chapter that presents the actual curriculum guide. First an outline is given and the detailed curriculum is to follow. The outline contains nine major section which include Career Education, Safety, Power Tools,

Hand Tools, Hand Operated Equipment, Supplies and Materials, Other Equipment, Computation, and Following Instructions.

A brief description is presented explaining how the detailed curriculum will be presented and some changes that may be made due to school board restraints and so on. Each of the nine major headings will be dealt with individually and all of the objectives contained within those sections are specific measurable performance objectives.

After all nine sections of the curriculum are completed the references follow.

Impact Of The Curriculum

The impact that the thesis will play on the education of these individuals may be significant. These trainable mentally handicapped students need extra resources, extra time, and extra money poured their way. The government will not see a great advantage to putting a large amount of money towards this field of education, if there is no channel to provide results. Many people wait until there is money to do something, and by that time it may very well be too late. The time to educate trainable mentally handicapped students is now, whether there is money, resources, or time. This thesis may provide a valuable starting point

to show the education system that industrial education has something to offer the trainable mentally handicapped student as well as the regular stream student. Many of these methods can and should be used to teach all students whether they are regular stream students, gifted students, or special education students. All students have a gift and it is up to the education system to help discover this gift and then provide help and direction to develop this gift. The thesis project is an attempt to discover the gifts of a specific group of individuals and develop them to their full potential.

Areas For Further Research

There are many areas of the curriculum for special education that have not been pursued to date. Industrial education is a very small field within the total education system and has been a relatively dormant field in terms of educational research. This must change if the profession is to advance past the industrial arts as a dumping ground concept. The entire field of industrial education must do some research and development in the area of curriculum development if it is going to survive in the total education picture of the future.

An area for further research might include doing a follow up study to determine the employability of TMH students after leaving such a program as presented in chapter IV. The students work behaviour and performance skills could be compared to a group of students who have not been educated by this program.

Another area that needs further research is that of field testing this curriculum so that it may be re-evaluated to determine if revisions are necessary to enable students to become more employable within the community.

A topic of research to consider is whether or not a curriculum program such as presented in chapter IV should have a heavy component of work experience included. Just what makes these students employable within the community, and if so, what benefit and/or services could TMH students provide.

An interesting research study could be developed by doing a cost-benefit analysis. Some questions that might be asked: (1) are the cost involved to educate TMH students higher than those nedded to educate the regular stream student (2) does more cost mean a better education for these students, and (3) to what extent is the public willing to pay for the education of TMH students?

There needs to be much more research by teachers themselves as these are the people who will be presenting the curriculum to students. The support for curriculum development should come from the entire education system not just a small part of the government. The entire education system is the students, parents, teachers, and community, to name a few.

The thesis is just the beginning of curriculum development for trainable mentally handicapped students as there is no other project such as this to date. Teachers must not let curriculum development stop there, and more research needs to be done in all areas of industrial education.

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REFERENCES

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APPENDIX 1

Sample Letter Requesting Information

DISTRICT LETTERHEAD

January 15, 1983.

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I am currently attending the University of Alberta in Edmonton, Alberta, as a Masters' student in the Faculty of Education. My thesis project is entitled "Development of an Industrial Education Curriculum for Trainable Mentally Handicapped Students." I am also teaching Trainable Mentally Handicapped students who range in age from 11 to 18 years in my employing school district. These classes each contain approximately six girls and six boys.

Since there is little information readily available on education programs for Trainable Mentally Handicapped students, I see a need to seek national as well as local sources of information on these special needs students. While conducting the literature review I came across a book entitled "A Professional's Guide to Working with the Learning-Disabled Child", Brunner/Mazel Publishers, 1978, New York. In the appendices was a list of National Associations in Related Fields and Directories, one of which is your Association. I would greatly appreciate any information or materials you have available on education or related programs for Trainable Mentally Handicapped students operated by either yourselves or other agencies. I would also like to know how I may obtain these materials and if there is a purchase price involved. I would be pleased to receive material on current tested education programs for TMH students for inclusion in my thesis project for the improvement in the quality of education of our special needs students.

I can be contacted at the following addresses:

Colin Scheelar,
9 Anita Crescent,
St. Albert, Alberta, Canada.
T8N 2W3

(403) 458-6967

Sir George Simpson Junior High School,
Colin Scheelar,
50 Grosvenor Boulevard,
St. Albert, Alberta, Canada.
T8N 0X6

(403) 459-4456

Contributors to the project may obtain a copy of the actual curriculum or the entire project if they desire, by writing to me at these addresses or to the

Supervisor of Student Services at the school district office:

St. Albert Protestant Separate School District No. 6,
60 Sir Winston Churchill Avenue,
St. Albert, Alberta, Canada.
T8N 0G4

(403) 458-2060

The expected completion date of this project is August, 1983, making it available by the early fall.

I thank you for your time and help and await your reply.

Sincerely,

Colin Scheelar

APPENDIX 2

Sample of Activities for TMH

SAMPLE OF ACTIVITIES FOR TMH

Large-bolt-board Exercise

Materials

1 piece of stock wood (¾" x 3" x 14") with five ¾" holes, 2½" apart

5 bolts (¾" x 2" long)

5 nuts (¾")

5 washers (¾")

1 wrench (not required)

Procedure

A. Have student adjust to the new materials involved.

B. Show student how exercise is assembled.

C. Have student place one bolt through the first hole in the piece of stock wood.

D. Have student place washer on bolt.

E. Have student place nut on bolt and turn in a clockwise direction until the nut is completely tight.

F. Have student place the other four bolts onto the piece of stock wood one at a time.

G. After all five bolts have been placed, have student take apart the assembly.

H. As student progresses, a wrench may be added to the exercise.

Errors

A. Students trying to assemble more than one bolt at a time.

B. Turning the nut in a counterclockwise direction.

APPENDIX 3

List Of Projects For TMH

LIST OF PROJECTS FOR TMH

Following is a list of projects that can be used with TMH students.

- Hat and Coat Hook
- Bud Vase
- Charcoal Scoop
- Letter Holder
- Dust Pan
- Pencil Holder
- Game Board
- Recipe Holder
- Memo Pad Holder, Plastics
- Memo Pad Holder, Metals

APPENDIX 4

Suggested Equipment List For TMH Students

SUGGESTED EQUIPMENT LIST

Some of these tools and equipment may already be in the industrial education lab. Keep this in mind when ordering equipment and tools.

This is also a suggested list based on the included curriculum and if changed or adjusted the tools and equipment may need to be adjusted as well.

Tool or Equipment	Number	Comments
Bandsaw	1	
Disk sander	1	
Orbital sander	1	
Belt sander	1	
Drill press	1	
Electric hand drill	2	2 would be better
Buffer	1	
Vacuum former	1	
Injection molder	1	
Electirc soldering iron	1	
Ball-peen hammer	6	Hammering exercises
Claw hammer	6	Hammering exercises
Robertson screwdriver	2	
Phillips screwdriver	2	
Conventional screwdriver	2	
Ten-inch flat mill file	12	
Ten-inch flat bastard file	12	
Ten-inch half round cabinet file	6	
Eight-inch traingular file	2	
Wood rasp	2	
Surform	2	
Backsaw	12	Cutting exercises
Wood chisel	8	Set of 8 different sizes
Clamps handscrew 6"	2	
Clamps handscrew 12"	2	
Clamps pipe	2	
Clamps C-clamps 4"	2	
Clamps C-clamps 6"	2	
Ruler 30 centimeters	12	Measuring exercises
Ruler 300 millimeters	12	Measuring exercises
Squares combination	6	
Squares tri-squares	6	
Squares carpenter	2	
Planes block	2	
Planes jack	6	
Planes smoothing	6	
Vice	12	

Tool or Equipment	Number	Comments
Wrench-crescent	2	
Wrench-box open end	1 set	10 mm. to 17 mm.
Wrench-double open end	1 set	10 mm. to 17 mm.
Utility knife	2	
Tin snips	6	Cutting exercises
Staple gun	1	
Pliers - needlenose	2	
Pliers - sidecutters	2	
Pliers - conventional	2	
Pliers - vise grip	2	
Brace	1	
Auger bits	1 set	#4 to #16
Hack saw	6	
Scissors	4	
Leather stamps	6	A variety
Revolving punch	2	
Swivel knife	6	
Miter box	1	
Box and Pan brake	1	
Di-Acro circle bender	1	
Strip heater	1	
Frying pan	2	

APPENDIX 5

Agencies And Institutions

Agencies And Institutions

The following agencies and/or institutions were contacted and they all deal in some respect with mentally handicapped students.

University of California at Los Angeles,
Mental Retardation Research Center,
760 Westwood Plaza,
Los Angeles, California,
90024

University of Nebraska,
Meyer Children's Rehabilitation Institute,
University of Nebraska Medical Center,
Omaha, Nebraska,
68105

University of Southern California,
UAF Training Project,
4660 Sunset Boulevard,
Los Angeles, California,
90027

University of Colorado Medical Center,
JFK Child Development Center,
Colorado General Hospital
4200 E. 9th Avenue,
Denver, Colorado.

Manhattan Chapter,
New York Association for Brain Injured
Children and Associations for Children
with Learning Disabilities,
P. O. Box 710,
Grand Central Station,
New York, N. Y.
10017

University of Kansas,
Kansas Center for the Mentally Retarded,
Haworth Hall, Room 233,
Lawrence, Kansas,
66044

Publisher,
Directory for Exceptional Children,
11 Beacon Street,
Boston, Massachusetts.
02108

A Guide of Agencies and
Organizations Concerned With
Exceptional Children,
1920 Association Drive,
Reston, Virginia.
22091

University of Washington,
Child Development and Mental
Retardation Center,
Seattle, Washington.
98105

Executive Director,
Alexander Graham Bell Association
For The Deaf,
3417 Volta Place, N. W.,
Washington, D. C.
20007

Executive Director,
Allergy Foundation of America,
801 Second Avenue,
New York, New York.
10017

Executive Director,
American Academy of Neurology,
4015 W. 65th Street,
Minneapolis, Minnesota
55435

Executive Director,
American Association of Opthalmology,
1100 17th Street, N. W.,
Washington, D. C.
20036

Executive Director,
American Association of Psychiatric
Services for Children,
1701 13th Street N. W.,
Washington, D. C.
20009

Director of Member Agencies,
Family Service Association of America,
44 East 23rd Street,
New York, New York,
10010

University of State of New York,
State Education Department Instructional
Materials Center,
55 East 11 Street,
Albany, N. Y.
12234

School Resource Directory,
New York Urban Coalition,
1270 Avenue of the Americas,
New York, New York,
10020

The American Association of Psychiatric Services for
Children,
1701 18th Street N.W.,
Washington, D.C.
20009

Executive Secretary,
National Association of Private Schools for Exceptional
Children,
P>O> Box 928,
Lake Wales, Florida.
83853

Executive Director,
American Physical Therapy Association,
1156 15th Street, N.W.,
Washington, D.C.
20005

Executive Director,
American Psychological Association,
1200 17th Street, N.W.,
Washington, D.C.,
20036

Executive Director,
American Rehabilitation Counselors Association,
1507 New Hampshire Avenue, N.W.,
Washington, D.C.

Executive Secretary,
American Speech and Hearing Association,
9030 Old Georgetown Road,
Bethesda, Md.
20014

Executive Secretary,
Association for Children with Learning Disabilities,
4156 Library Road,
Pittsburgh, Pennsylvania.
15234

University of Cincinnati,
UAF,
295 Erkenbrechner Avenue,
Cincinnati, Ohio.
45229

University of Oregon at Eugene,
Cliniical Services Building,
College of Education,
Eugene, Oregon.
97403

University of Oregon at Portland,
University of Oregon Medical School,
Portland, Oregon.
97201

Pennsylvania State University,
Rackley Building,
University Park, Pennsylvania.
16802

St. Christopher's Hospital,
Handicapped Children's Unit,
2603 North Fifth Street,
Philadelphia, Pennsylvania.
19133

University of Tennessee,
Child Development Center,
711 Jefferson Avenue,
Memphis, Tennessee.
38105

Utah State University,
UAF Exceptional Child Center,
Logan, Utah.
84321

Executive Director,
The Council for EXceptional Children,
1920 Association Drive,
Reston, Virginia.
22901

Executive Director,
Epilepsy Foundation of America,
1828 "L" Street, N.W.,
Suite 406,
Washington, D.C.
20036

General Director,
Family Service Association of America,
44 East 23rd Street,
New York, New York.
10010

Executive Director,
National Association for Mental Health, Inc.,
1800 North Kent Street,
Arlington, Virginia.
22209

Executive Director,
National Association for Retarded Citizens,
2709 Avenue "E" East,
Arlington, Texas.
76011

Executive Director,
National Association of Social Workers, Inc.,
1425 H Street, N.W.,
Suite 600,
Washington, D.C.
20005

Executive Director,
National Easter Seal Society for Crippled Children and Adults,
2023 West Ogden Avenue,
Chicago, Illinois.
60612

Executive Director,
Orton Society, Inc.,
8415 Bellona Lane,
Towson, Md.
21204

Executive Director,
United Cerebral Palsy Association, Inc.,
66 East 34th Street,
New York, New York.
10016

New York Medical College,
Mental Retardation Institute,
1249 Fifth Avenue,
New York, New York.
10029

University of North Carolina,
Division for Disorders of Development and Learning,
Box 523,
North Carolina Memorial Hospital,
Chappel Hill, North Carolina,
27514

Johns Hopkins University,
John F. Kennedy Institute,
707 North Broadway,
Baltimore, Maryland,
21205

Children's Hospital Medical Center,
Development Evaluation Clinic,
300 Longwood Avenue,
Boston, Massachusetts,
02115

Walter E. Fernald State School,
Eunice Kennedy Shriver Center,
200 Trapelo Road,
Waltham, Massachusetts,
02154

University of Michigan,
Institute for the Study of Mental Retardation and
Related Disabilities,
611 Church Street,
Ann Arbor, Michigan,
48104

St. Louis University,
221 North Grand Boulevard,
St. Louis, Missouri,
63103

University of Alabama at Birmingham,
Center for Developmental and Learning Disorders,
1919 Seventh Avenue, South,
Birmingham, Alabama,
35223

University of Alabama at Tuscaloosa,
Center for Developmental and Learning Disorder
Tuscaloosa, Alabama.
35401

University of California - Irvine,
Department of Pediatrics,
Irvine, California.
92664

University of Georgia,
Georgia Retardation Center,
Athens Unit,
860 College Station Road,
Athens, Georgia.
30601

University of Georgia,
Georgia Retardation Center,
Atlanta Unit,
4770 North Peachtree Road,
Atlanta, Georgia.
30341

University of Indiana,
UAF,
2853 East 10th Street,
Bloomington, Indiana.
47401

University of Indiana - Indianapolis,
Medical Center,
1100 West Michigan Street,
Indianapolis, Indiana.
47401

University of Iowa,
University Hospital School,
Iowa City, Iowa.
52240

University of Kansas Medical Center,
Children's Rehabilitation Unit,
University of Kansas,
Kansas City, Kansas,
66103

University of Kansas,
UAF Central Office,
223 Haworth Street,
Lawrence, Kansas,
66044

Parsons State College Hospital and Training Center,
UAF,
Parsons, Kansas,
67357

University of Kentucky,
University Center for the Handicapped,
University of Kentucky Medical Center,
Lexington, Kentucky,
40506

Georgetown University Medical Center,
University Affiliated Program for Child Development,
Washington, D. C.
20007